STIC Search Report
EIC 1700

Scientific & Technical Information Center
USPTO

STIC Database Tracking Number: 117568

TO: Raymond Alejandro **Location: REM 6B59** **Art Unit : 1745** **March 25, 2004** **Case Serial Number: 10/018303**	**From: Barba Koroma** **Location: EIC 1700** **REM EO4 A30** **Phone: 571 272 2546** **barba.koroma@uspto.gov**

Search Notes

Examiner Alejandro,
Please find attached results of the search you requested. Various components of the claimed invention as spelt out in the claims were searched in multiple databases.

For your convenience, titles of hits have been listed to help you peruse the results set quickly. This is followed by a detailed printout of records. Please let me know if you have any questions.
Thanks.

sira
Search and Information Resources Administration

Access DB# 117568

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Raymond Alejandro Examiner #: 76895 Date: 03/17/04
Art Unit: 1745 Phone Number ~~30~~ 571 272-1282 Serial Number: 10/018303
Mail Box and Bldg/Room Location: Remsen 6B59 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Polymer Electrolyte Fuel Cell & its USAGE

Inventors (please provide full names): Sakai et al

Earliest Priority Filing Date: 10/30/01

For Sequence Searches Only *Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please, search for subject matter of claims 1-4 & 6.

****

STAFF USE ONLY	Type of Search	Vendors and cost where applicable
Searcher:	NA Sequence (#)	STN
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#)	Questel/Orbit
Date Searcher Picked Up:	Bibliographic	Dr.Link
Date Completed:	Litigation	Lexis/Nexis
Searcher Prep & Review Time:	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time:	Other	Other (specify)

PTO-1590 (8-01)

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=> file caplus
FILE 'CAPLUS' ENTERED AT 15:30:57 ON 25 MAR 2004
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
PLEASE SEE "HELP USAGETERMS" FOR DETAILS.
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```



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FILE COVERS 1907 - 25 Mar 2004  VOL 140 ISS 13
FILE LAST UPDATED: 24 Mar 2004  (20040324/ED)

  This file contains CAS Registry Numbers for easy and accurate
  substance identification.


=> file wpix
FILE 'WPIX' ENTERED AT 15:31:01 ON 25 MAR 2004
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FILE LAST UPDATED:          24 MAR 2004      <20040324/UP>
MOST RECENT DERWENT UPDATE:     200420        <200420/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE


>>> FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE,
    PLEASE VISIT:
 http://www.stn-international.de/training_center/patents/stn_guide.pdf <<<

>>> FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE
    http://thomsonderwent.com/coverage/latestupdates/           <<<

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    GUIDES, PLEASE VISIT:
    http://thomsonderwent.com/support/userguides/               <<<

>>> ADDITIONAL POLYMER INDEXING CODES WILL BE IMPLEMENTED FROM
    DERWENT UPDATE 200403.
    THE TIME RANGE CODE WILL ALSO CHANGE FROM 018 TO 2004.
    SDIS USING THE TIME RANGE CODE WILL NEED TO BE UPDATED.
    FOR FURTHER DETAILS: http://thomsonderwent.com/chem/polymers/ <<<


=> file japio
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FILE 'JAPIO' ENTERED AT 15:31:05 ON 25 MAR 2004

FILE LAST UPDATED: 1 MAR 2004 <20040301/UP>
FILE COVERS APR 1973 TO OCTOBER 31, 2003

<<< GRAPHIC IMAGES AVAILABLE >>>

=> d que

L1	12	SEA	FILE=CAPLUS ABB=ON	PLU=ON	POLYMER(5A)ELECTROLYTE(4A)CELL AND USAGE
L2	4270	SEA	FILE=CAPLUS ABB=ON	PLU=ON	POLYMER(5A)ELECTROLYTE(4A)CELL
L3	14910	SEA	FILE=CAPLUS ABB=ON	PLU=ON	POLYMER(5A)ELECTROLYTE
L4	14910	SEA	FILE=CAPLUS ABB=ON	PLU=ON	(L1 OR L2 OR L3)
L5	727	SEA	FILE=CAPLUS ABB=ON	PLU=ON	STACK? AND L4
L6	4	SEA	FILE=CAPLUS ABB=ON	PLU=ON	RETAIN?(4A)PLATE AND L4
L7	1839	SEA	FILE=CAPLUS ABB=ON	PLU=ON	SEPARATOR?(4A)PLATE?
L8	95	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L7 AND L4
L9	88	SEA	FILE=CAPLUS ABB=ON	PLU=ON	GAS(4A)SUPPLY AND L4
L10	179	SEA	FILE=CAPLUS ABB=ON	PLU=ON	(L8 OR L9)
L11	72	SEA	FILE=CAPLUS ABB=ON	PLU=ON	(L10 OR L6) AND L5
L14	15	SEA	FILE=CAPLUS ABB=ON	PLU=ON	COOL?(4A)WATER? AND (L10 OR L11)
L15	80	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L11 OR L14
L18	624	SEA	FILE=CAPLUS ABB=ON	PLU=ON	FLOW?(4A)CHANNEL?(4A)WATER?
L25	4	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L18 AND L4
L26	84	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L25 OR L15
L27	84	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L26 AND POLYMER?
L31	10816	SEA	FILE=CAPLUS ABB=ON	PLU=ON	VOLTAGE(5A)(MEASUREMENT OR DISPLAY)
L38	13	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L3 AND L31
L39	97	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L27 OR L38
L40	6	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L39 AND CONDUCT?(4A)SEPARATOR AND PLATES
L42	31	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L39 AND GAS(3A)SUPPLY
L43	37	SEA	FILE=CAPLUS ABB=ON	PLU=ON	L40 OR L42
L45	54	SEA	FILE=WPIX ABB=ON	PLU=ON	L40 OR L42
L46	15	SEA	FILE=WPIX ABB=ON	PLU=ON	L45 AND POLYMER(4A)ELECTROLYTE(5A)MEMBRANE
L48	3	SEA	FILE=JAPIO ABB=ON	PLU=ON	L45 AND POLYMER(4A)ELECTROLYTE(5A)MEMBRANE
L49	53	DUP REM	L43 L46 L48 (2 DUPLICATES REMOVED)		

=> d ti 1-53
YOU HAVE REQUESTED DATA FROM FILE 'CAPLUS, WPIX, JAPIO' - CONTINUE? (Y)/N:y

L49 ANSWER 1 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fuel cell system

L49 ANSWER 2 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer electrolyte** fuel-**cell** system for shortened warming up

L49 ANSWER 3 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Fuel cell system, has transfer cell with polybenzimidazole ion exchange membrane coupled to **gas** stream, and power **supply** coupled to cell such that current separates hydrogen in cell from gas stream to pure hydrogen stream.

L49 ANSWER 4 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
TI **Conductive separator plate** for **polymer electrolyte** fuel **cell**

L49 ANSWER 5 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Apparatus for supplying hydrogen by using **polymer electrolyte**-type water electrolysis tank

L49 ANSWER 6 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Apparatus for supplying hydrogen by using **polymer-electrolyte**-type water electrolysis tank and its starting method

L49 ANSWER 7 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer electrolyte**-type fuel **cell** system having moisture controller for air provided to oxidizing gas

L49 ANSWER 8 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fuel cell system and its control method

L49 ANSWER 9 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer electrolyte** fuel **cell** power plant and its operation

L49 ANSWER 10 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Improvements in sealing structure of **polymer electrolyte** fuel **cell**

L49 ANSWER 11 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Electrode for **polymer electrolyte** fuel **cell** e.g. for electric vehicle or motorized wheelchair, has solid **polymer electrolyte membrane**, electrode layers and reinforcing members integrally formed by sealing member.

L49 ANSWER 12 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Fuel cell **stack**, has cell units arranged symmetrically, membrane electrode assembly interposed between anode and cathode and port to **supply** reactant **gases** to cell unit.

L49 ANSWER 13 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Polymer electrolyte** fuel **cell** used as portable power source includes electrolyte membrane - electrode assembly

with pair of electrodes provided with predetermined tightening pressure.

L49 ANSWER 14 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Polymer electrolyte** fuel **cell**, for portable power source, electric vehicle and co generation system, includes pair of end plates made of electrically insulating resin-dominant material.

L49 ANSWER 15 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Design, fabrication, and assembly of a **polymer electrolyte** membrane fuel **cell** (PEMFC)

L49 ANSWER 16 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer electrolyte** fuel **cell** and cooling system thereof

L49 ANSWER 17 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI High-**polymer electrolyte** fuel **cell**

L49 ANSWER 18 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Method of supplying reaction gas in fuel **cell** of solid **polymer electrolyte** fuel **cell** assembly

L49 ANSWER 19 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer electrolyte** type fuel **cell**

L49 ANSWER 20 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers

L49 ANSWER 21 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Modular **polymer electrolyte** membrane unit fuel **cell** assembly and fuel cell **stack**

L49 ANSWER 22 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Method for operation of **polymer-electrolyte** fuel **cell** power plant

L49 ANSWER 23 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fuel cell system

L49 ANSWER 24 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer electrolyte** fuel **cell** power plant and its operation method

L49 ANSWER 25 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer-electrolyte** fuel **cell** combined with thermoelectric transducer and fuel cell **stack**

L49 ANSWER 26 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer-electrolyte** fuel **cell**

L49 ANSWER 27 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN

TI Method of supplying reaction gas in solid **polymer electrolyte** fuel **cell** assembly

L49 ANSWER 28 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Impregnated carbon fiber fabrics for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**

L49 ANSWER 29 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Supplying of hydrogen gas stream to fuel cell anode, involves introducing feed gas stream to adsorption module having chemically distinct adsorbents which adsorb contaminant to produce pure hydrogen gas stream.

L49 ANSWER 30 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
TI Method of controlling **polymer electrolyte** fuel **cell** system

L49 ANSWER 31 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fuel cell power plants and their operation method

L49 ANSWER 32 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI High temperature membrane (HTM) fuel-cell installation - uses preheating device for preheating oxidant and for pre-heating at least one process gas independently of HTM fuel-cell unit operation.

L49 ANSWER 33 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Solid high molecular form fuel cell, has reactive **gas supply** stream, humidifier, inert **gas supply** unit, controller and separator of unit battery circulating gas before generating electricity by controller.

L49 ANSWER 34 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Polymer electrolyte** fuel **cells** and their operation method

L49 ANSWER 35 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Fuel cell **stack** with separator of a laminate structure

L49 ANSWER 36 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer electrolyte** fuel **cells**

L49 ANSWER 37 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Fuel cell system includes a fuel cell **stack** comprising fuel cells having membrane-electrode assemblies that are hydrated with liquid water, and bipolar plates for distributing hydrogen fuel gas and water.

L49 ANSWER 38 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Polymer electrolyte** fuel **cell** for portable power sources, electric vehicle power sources and domestic co-generation systems has reliable unit cell **stack** fastening mechanism.

L49 ANSWER 39 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN

TI **Polymer electrolyte** fuel **cell stacks**

L49 ANSWER 40 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer electrolyte** fuel **cell** power plants

L49 ANSWER 41 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI PEM fuel cell system with dampening and/or cooling with liquid medium, their use as well as a method for dampening and cooling of such system

L49 ANSWER 42 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Fuel supply arrangement in solid **polymer electrolyte** type fuel battery - includes gas flow path equipped with water inlet through which water is supplied among fuel gas and oxidising agent gas flow paths.

L49 ANSWER 43 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer electrolyte** fuel **cell** power plants

L49 ANSWER 44 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI **Polymer electrolyte membrane** fuel **cell stack.** - Uses **stack** of fuel cells with membrane electrode assembly with gas distributor supplying gas to anode layer..

L49 ANSWER 45 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
TI Fuel cell battery flow distribution evaluation method - detecting voltage characteristic across each cell during supply of anode and cathode spaces with gas flow having varying hydrogen partial pressure.

L49 ANSWER 46 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Method for operation condition monitoring and operation control for **polymer electrolyte** fuel **cell stacks**

L49 ANSWER 47 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer electrolyte** fuel **cells**

L49 ANSWER 48 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI **Stacked** fuel **cell** with solid **polymer electrolyte**

L49 ANSWER 49 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymer electrolyte** fuel **cell stacks** with built-in cathode gas humidifying means

L49 ANSWER 50 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
TI Solid **polymeric** electrolyte fuel-cell power plants and their operation

L49 ANSWER 51 OF 53 JAPIO (C) 2004 JPO on STN
TI PEM FUEL CELL **STACK** AND ITS MANUFACTURING METHOD

L49 ANSWER 52 OF 53 JAPIO (C) 2004 JPO on STN
TI **POLYMER-ELECTROLYTE** FUEL **CELL STACK**
AND ELECTRIC VEHICLE WITH THIS FUEL CELL **STACK**

L49 ANSWER 53 OF 53 JAPIO (C) 2004 JPO on STN
TI FUEL CELL SYSTEM

=> d all 1-53 l49
YOU HAVE REQUESTED DATA FROM FILE 'CAPLUS, WPIX, JAPIO' - CONTINUE? (Y)/N:y

L49 ANSWER 1 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2004:204128 CAPLUS
DN 140:202499
ED Entered STN: 14 Mar 2004
TI Fuel cell system
IN Morita, Koji
PA Nissan Motor Co., Ltd., Japan
SO PCT Int. Appl., 38 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M008-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2004021494	A2	20040311	WO 2003-JP10833	20030827

W: JP, US
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR
PRAI JP 2002-252738 A 20020830
AB A fuel cell assembly has a fuel **cell stack** provided with a **polymer electrolyte** membrane, an air electrode and a fuel electrode; an air supply device for supplying air; a fuel **gas supply** device for supplying fuel **gas**, and a humidity regulation module allowing movement of water from a humid air passage to a dry air passage. The air electrode is divided into an upstream air electrode and a downstream air electrode. The air supplied from the air supply device is supplied to the upstream air electrode after passing through the dry air passage. The air discharged from the upstream air electrode is supplied to the downstream air electrode after passing through the humid air passage.
ST fuel cell system cathode water management
IT Fuel cell cathodes
Fuel cells
(water management in cathode of fuel cell system)

L49 ANSWER 2 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN

AN 2004:77109 CAPLUS
DN 140:114264
ED Entered STN: 30 Jan 2004
TI **Polymer electrolyte** fuel-**cell** system for shortened warming up
IN Horiguchi, Munehisa; Shiraishi, Koichi
PA Equos Research Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-06; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004031176	A2	20040129	JP 2002-186937	20020626

PRAI JP 2002-186937 20020626
AB The claimed system is equipped with (1) a means for retaining a fuel gas under contact with an anode in a fuel cell **stack**, (2) a means for introducing a fuel gas to (1), (3) a means for discharging the fuel gas from (1), (4) a means for detecting temperature of the fuel cell, and (5) a means for retaining the fuel gas in (1) while the detected temperature is lower than predetd. temperature The system provides high heat efficiency by suppressing heat discharge from the **stack.**
ST **polymer electrolyte** fuel **cell** system warming up
IT Fuel cells
(power plants; fuel-cell system with controlled fuel **gas supply** for shortened warming up)
IT 1333-74-0, Hydrogen, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(fuel-cell system with controlled fuel **gas supply** for shortened warming up)

L49 ANSWER 3 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2004-179654 [17] WPIX
DNN N2004-142932
TI Fuel cell system, has transfer cell with polybenzimidazole ion exchange membrane coupled to **gas** stream, and power **supply** coupled to cell such that current separates hydrogen in cell from gas stream to pure hydrogen stream.
DC X16
IN BALLANTINE, A W; CHARTRAND, R L
PA (PLUG-N) PLUG POWER INC
CYC 1
PI US 2004028979 A1 20040212 (200417)* 19p H01M008-04
ADT US 2004028979 A1 US 2002-214019 20020807
PRAI US 2002-214019 20020807
IC ICM H01M008-04
ICS H01M008-10

AB US2004028979 A UPAB: 20040310
NOVELTY - The system has a transfer cell (94) coupled to a gas stream, where the cell includes a polybenzimidazole ion exchange membrane. A power supply is coupled to the cell such that the current from the supply separates hydrogen in the cell from gas stream to a pure hydrogen stream. A **polymer electrolyte membrane** fuel **cell** is coupled to the cell to react with a portion of pure hydrogen.
USE - Used for converting chemical energy into electrical energy that is fed to load supplying electricity to residential appliance.
ADVANTAGE - The transfer cell uses polybenzimidazole ion exchange membrane, thereby avoiding the poisoning of the cell with the carbon monoxide from the gas stream.
DESCRIPTION OF DRAWING(S) - The drawing shows a fuel cell system with an electrochemical transfer cell.
Transfer cell 94
Fuel cell **stack** 96
Vent 110
Switch 116
Electrical connector 118
Dwg.4/8
FS EPI
FA AB; GI
MC EPI: X16-C01C; X16-C09

L49 ANSWER 4 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
AN 2003:203523 CAPLUS
DN 138:207861
ED Entered STN: 14 Mar 2003
TI **Conductive separator plate** for **polymer electrolyte** fuel **cell**
IN Kusakabe, Hiroki; Hatoh, Kazuhito; Ohara, Hideo; Hase, Nobuhiro; Kobayashi, Susumu; Yamazaki, Tatsuto; Takeguchi, Shinsuke
PA Matsushita Electric Industrial Co., Ltd., Japan
SO Eur. Pat. Appl., 14 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1291946	A2	20030312	EP 2002-256219	20020909
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	JP 2003163015	A2	20030606	JP 2002-264353	20020910
	CN 1405906	A	20030326	CN 2002-131539	20020911
	US 2003072986	A1	20030417	US 2002-238904	20020911
PRAI	JP 2001-274602	A	20010911		

AB A **polymer electrolyte** fuel **cell** comprises a

cell stack comprising a plurality of membrane electrode assemblies and a plurality of **conductive separator plates** that are **stacked** alternately, each of the membrane electrode assemblies comprising a hydrogen-ion conductive **polymer electrolyte** membrane, and an anode and a cathode sandwiching the **polymer electrolyte** membrane. The **conductive separator plate** is formed of a molded plate comprising a carbon powder and a binder, the **conductive separator plate** having a main portion which is raised from a peripheral portion surrounding the main portion, the main portion being in contact with the anode or the cathode and being provided with a gas flow path for supplying a fuel gas to the anode or a gas flow path for supplying an oxidant gas to the cathode.

ST **polymer electrolyte** fuel **cell** **conductive separator plate**

IT Electric vehicles
Fuel **cell electrolytes**
Fuel cell **separators**
Polymer electrolytes
Solid state fuel **cells**
(**conductive separator plate** for **polymer electrolyte** fuel **cell**)

IT Carbon black, uses
Carbon fibers, uses
Fluoro rubber
RL: DEV (Device component use); USES (Uses)
(**conductive separator plate** for **polymer electrolyte** fuel **cell**)

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; **conductive separator plate** for **polymer electrolyte** fuel **cell**)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; **conductive separator plate** for **polymer electrolyte** fuel **cell**)

IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; **conductive separator plate** for **polymer electrolyte** fuel **cell**)

IT Fuel cells
(power plants; **conductive separator plate** for **polymer electrolyte** fuel **cell**)

IT 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses
RL: CAT (Catalyst use); USES (Uses)
(**conductive separator plate** for **polymer electrolyte** fuel **cell**)

IT 7440-44-0, Carbon, uses 163294-14-2, Nafion 112
RL: DEV (Device component use); USES (Uses)

(**conductive separator plate** for **polymer electrolyte** fuel **cell**)

L49 ANSWER 5 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:945661 CAPLUS
DN 140:7129
ED Entered STN: 04 Dec 2003
TI Apparatus for supplying hydrogen by using **polymer electrolyte**-type water electrolysis tank
IN Takama, Toshihide
PA Hitachi Shipbuilding and Engineering Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C25B001-10
ICS C02F001-42; C02F001-44; C02F001-46; C25B001-12; C25B009-00; H01M008-00
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 72
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2003342769	A2	20031203	JP 2002-156612	20020530
PRAI JP 2002-156612		20020530		

AB The title apparatus is equipped with a pressure container for storing a water electrolysis tank by filling a gap with **water**, a **cooling water**-circulating line for returning water after treating the filled water, and a pressure-difference control line to give predetd. pressure difference between inside of the electrolysis tank and the pressure container. The apparatus, especially suitable for fuel-cell H station for 35-70 MPa high-pressure H **gas supply**, is prevented from damage of the **polymer electrolyte** membrane.

ST hydrogen fuel supply app **polymer electrolyte** water electrolysis pressure

IT Electrolysis
Fuel gas manufacturing
(apparatus for supplying hydrogen by using **polymer electrolyte**-type water electrolysis tank stored in pressure container)

IT 1333-74-0P, Hydrogen, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(apparatus for supplying hydrogen by using **polymer electrolyte**-type water electrolysis tank stored in pressure container)

IT 7782-44-7P, Oxygen, preparation
RL: PNU (Preparation, unclassified); PREP (Preparation)
(apparatus for supplying hydrogen by using **polymer electrolyte**-type water electrolysis tank stored in pressure container)

IT 7732-18-5, Water, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(apparatus for supplying hydrogen by using **polymer electrolyte**-type water electrolysis tank stored in pressure container)

L49 ANSWER 6 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:943526 CAPLUS
DN 140:7126
ED Entered STN: 04 Dec 2003
TI Apparatus for supplying hydrogen by using **polymer-electrolyte**-type water electrolysis tank and its starting method
IN Oshiro, Hitoshi; Kondo, Masayoshi; Tatsumi, Hiroshi
PA Hitachi Shipbuilding and Engineering Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C25B001-10
ICS C25B001-12; C25B009-00; H01M008-04
CC 52-1 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 49, 72
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003342768	A2	20031203	JP 2002-156611	20020530
PRAI	JP 2002-156611		20020530		

AB The title apparatus is equipped with an electrolytic cell, a H gas/liquid separation chamber, an O gas/liquid separation chamber, and a water circulation line, where the electrolytic cell has a coolant inlet for heat removal. The apparatus may be equipped with a pressure container for storing the electrolytic cell by filling a gap with water and a pressure-control pipe connecting the gap with the O gas/liquid separation chamber, where the claimed process comprises opening a pressure control valve in the pipe while starting up the apparatus and then closing the valve when the pressure container shows predetd. pressure. The apparatus, especially suitable for fuel-cell H station for 35-70 MPa high-pressure H **gas supply**, is prevented from damage of the **polymer electrolyte** membrane.

ST hydrogen fuel supply app **polymer electrolyte water** electrolysis **cooling**

IT Cooling
Electrolysis
Fuel gas manufacturing
(apparatus containing cooling system for supplying hydrogen by using **polymer-electrolyte**-type water electrolysis tank)

IT 7782-44-7P, Oxygen, preparation
RL: PNU (Preparation, unclassified); PREP (Preparation)
(apparatus containing cooling system for supplying hydrogen by using **polymer-electrolyte**-type water electrolysis tank)

IT 1333-74-0P, Hydrogen, uses
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(coolant; apparatus containing cooling system for supplying hydrogen by using
polymer-electrolyte-type water electrolysis tank)
IT 7732-18-5, **Water**, uses
RL: NUU (Other use, unclassified); RCT (Reactant); RACT (Reactant or reagent); USES (Uses)
(**coolant**; apparatus containing **cooling** system for supplying hydrogen by using **polymer-electrolyte**-type water electrolysis tank)

L49 ANSWER 7 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:607901 CAPLUS
DN 139:136105
ED Entered STN: 08 Aug 2003
TI Solid **polymer electrolyte**-type fuel **cell** system having moisture controller for air provided to oxidizing gas
IN Fujii, Yosuke; Okamoto, Hideo; Murakami, Yoshikazu
PA Honda Motor Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-10; H01M008-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003223909	A2	20030808	JP 2002-333520	20021118
PRAI	JP 2001-358070	A	20011122		

AB The title fuel cell comprises a **stack** of unit cells, each of which is made up of a solid **polymer electrolyte** film having an anode and a cathode, a coolant **supply**, a fuel **gas supply**, an oxidizing **gas supply**, and a water recovery and circulation from the oxidizing offgas, wherein a moisture content in the oxidizing offgas is controlled by regulating an amount of the coolant, thereby controlling an amount of moisture supplied to the oxidizing gas.
ST solid **polymer electrolyte** fuel **cell** moisture control
IT Fuel **cells**
Water vapor
(solid **polymer electrolyte**-type fuel **cell** system having moisture controller for air provided to oxidizing gas)

L49 ANSWER 8 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:94666 CAPLUS
DN 138:156255
ED Entered STN: 07 Feb 2003

TI Fuel cell system and its control method
IN Horiguchi, Munehisa
PA Equos Research Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-04; B60L011-18; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2003036870	A2	20030207	JP 2001-224080	20010725
PRAI JP 2001-224080		20010725		

AB The system has a H/O fuel **cell stack**, containing a solid **polymer electrolyte** layer between a cathode supplied with air by an air passage and an anode supplied with H by an H gas passage; a H-storage means connected to the **stack** via the H **gas supply** passage; a H **supply** pipe supplying the H **gas** to the H **gas** passage; and a H **supply** means, containing a H filling pipe connected to an H filling inlet for introducing H from outside and H-storage means; where the H supply means has a means removing foreign matters from the H filling inlet. The system is controlled by the removal means for removing the foreign matters from the H filling inlet while the inlet is connected to an external H filling source.
ST fuel cell system structure control method hydrogen supply means; foreign matter removal hydrogen supply means fuel cell system
IT Fuel cells
(structure and control method of fuel cell systems containing containing H supply means with foreign matter removal means)
IT 1333-74-0, Hydrogen, uses
RL: DEV (Device component use); USES (Uses)
(structure and control method of fuel cell systems containing containing H supply means with foreign matter removal means)

L49 ANSWER 9 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:75504 CAPLUS
DN 138:140049
ED Entered STN: 31 Jan 2003
TI Solid **polymer electrolyte** fuel **cell** power plant and its operation
IN Aoki, Makoto
PA Fuji Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2003031254	A2	20030131	JP 2001-214857	20010716
PRAI	JP 2001-214857		20010716		

AB The power plant has a fuel **cell stack**, containing a solid **polymer electrolyte** held between a pair of electrodes, having a catalyst layer contacting the electrolyte, an air as oxidant gas supplied to the cathode, and a H fuel gas supplied to the anode; where ≥1 reaction gas is passed through an internal humidifier, and then supplied to the electrode. The power plant is operated by discharging the ≥1 reaction gas via the humidifier to outside the fuel cell within a predetd. time after stopping the reaction **gas supply** to the cell, and passing through an inert gas or an unhumidified reaction gas at a predetd. time owing to the decrease of moisture inside the cell.

ST fuel cell power plant structure reaction gas humidifier

IT Fuel cells
(power plants; structure and operation method of fuel cell power plants containing reaction gas humidifiers)

IT Humidity
(structure and operation method of fuel cell power plants containing reaction gas humidifiers)

L49 ANSWER 10 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN

AN 2003:298773 CAPLUS

DN 138:306816

ED Entered STN: 18 Apr 2003

TI Improvements in sealing structure of **polymer electrolyte** fuel **cell**

IN Kobayashi, Susumu; Hosaka, Masato; Hatoh, Kazuhito; Murakami, Hikaru; Takezawa, Mikio; Onishi, Takayuki

PA Matsushita Electric Industrial Co., Ltd., Japan

SO Eur. Pat. Appl., 29 pp.
CODEN: EPXXDW

DT Patent

LA English

IC ICM H01M008-10
ICS H01M008-24; H01M008-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1302996	A2	20030416	EP 2002-257108	20021014
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
	US 2003087142	A1	20030508	US 2002-270238	20021015
	CN 1412875	A	20030423	CN 2002-147317	20021016
	JP 2003197224	A2	20030711	JP 2002-301780	20021016
PRAI	JP 2001-318666	A	20011016		

AB The present invention provides a **polymer electrolyte** fuel **cell** in which neither cross leakage nor outward leakage

occurs with the application of low clamping pressures. The **polymer electrolyte** fuel **cell** comprises a unit cell, the unit cell comprising: a membrane electrode assembly (MEA) comprising a **polymer electrolyte** membrane, a gasket covering the periphery of the electrolyte membrane, an anode and a cathode attached to the electrolyte membrane; and **conductive separator plates** sandwiching the MEA there-between. The gasket and the **separator plates** have a pair of manifold apertures for each of fuel gas, oxidant gas and **cooling water.** The gasket comprises dummy ribs surrounding each of the manifold apertures, and the **separator plates** have grooves into which each of the dummy ribs is fitted loosely such that there is a clearance there-between. The gasket further has seal ribs surrounding each of the manifold apertures, the anode and the cathode, as well as seal ribs formed on both sides of each of gas passages connecting the fuel gas manifold apertures with the anode and gas passages connecting the oxidant gas manifold apertures with the cathode. These seal ribs, except for in the gas passages, are pressed against the **separator plates** by clamping pressure of the cell **stack** to form gas sealing sections.

ST sealing structure improvement **polymer electrolyte** fuel **cell**

IT Polyoxyalkylenes, uses
RL: DEV (Device component use); USES (Uses)
(fluorine- and sulfo-containing, ionomers; improvements in sealing structure of **polymer electrolyte** fuel **cell**
)

IT Gaskets
Seals (parts)
Solid state fuel cells
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)

IT Carbon black, uses
RL: CAT (Catalyst use); TEM (Technical or engineered material use); USES (Uses)
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)

IT Fluoropolymers, uses
RL: MOA (Modifier or additive use); USES (Uses)
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)

IT Carbon fibers, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)

IT Thermoplastic rubber
RL: DEV (Device component use); USES (Uses)
(polyester; improvements in sealing structure of **polymer electrolyte** fuel **cell**)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylene-, sulfo-containing, ionomers; improvements in sealing

structure of **polymer electrolyte** fuel **cell**
)
IT Ionomers
RL: DEV (Device component use); USES (Uses)
(polyoxyalkylenes, fluorine- and sulfo-containing; improvements in sealing structure of **polymer electrolyte** fuel **cell**
)
IT Polyester rubber
RL: TEM (Technical or engineered material use); USES (Uses)
(thermoplastic, Hytrel M 7240, gasket material; improvements in sealing structure of **polymer electrolyte** fuel **cell**
)
IT Polyester rubber
RL: DEV (Device component use); USES (Uses)
(thermoplastic; improvements in sealing structure of **polymer electrolyte** fuel **cell**)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); USES (Uses)
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)
IT 66796-30-3, Nafion 117
RL: DEV (Device component use); USES (Uses)
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)
IT 9002-84-0, Ptfe
RL: MOA (Modifier or additive use); USES (Uses)
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)
IT 9003-07-0, Polypropylene
RL: TEM (Technical or engineered material use); USES (Uses)
(improvements in sealing structure of **polymer electrolyte** fuel **cell**)

L49 ANSWER 11 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-616078 [58] WPIX
DNN N2003-490531 DNC C2003-168090
TI Electrode for **polymer electrolyte** fuel **cell**
e.g. for electric vehicle or motorized wheelchair, has solid **polymer electrolyte membrane**, electrode layers and reinforcing members integrally formed by sealing member.
DC A85 L03 X16 X21
IN IMAHASHI, J; KAMO, T; KOMACHIYA, M; KOYAMA, T; NISHIMURA, K
PA (HITA) HITACHI LTD; (IMAH-I) IMAHASHI J; (KAMO-I) KAMO T; (KOMA-I) KOMACHIYA M; (KOYA-I) KOYAMA T; (NISH-I) NISHIMURA K
CYC 4
PI US 2003082429 A1 20030501 (200358)* 22p H01M004-86
CA 2370993 A1 20030430 (200358) EN H01M004-86
DE 10207743 A1 20030522 (200358) H01M004-86
JP 2003142127 A 20030516 (200358) 14p H01M008-02
ADT US 2003082429 A1 US 2002-78534 20020221; CA 2370993 A1 CA 2002-2370993 20020207; DE 10207743 A1 DE 2002-10207743 20020222; JP 2003142127 A JP 2001-333605 20011031

PRAI JP 2001-333605 20011031
IC ICM H01M004-86; H01M008-02
ICS H01M002-14; H01M004-96; H01M008-04; H01M008-10; H01M008-24
AB US2003082429 A UPAB: 20030910
NOVELTY - The electrode has:
(i) a solid **polymer electrolyte membrane** (11);
(ii) electrode layers (12, 13) formed on respective faces of the membrane;
(iii) reinforcing members (14) that cover respective outer surfaces of the electrode layers; and
(iv) sealing member (15) that covers the reinforcing members.
The electrolyte membrane, electrode layers, and reinforcing members are formed by the sealing member.
DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:
(1) a **polymer electrolyte** fuel **cell** comprising the above electrode, and an anode and a cathode side separators arranged on both sides of the electrode;
(2) a separator for the above **polymer electrolyte** fuel **cell**; and
(3) a generating system comprising a hydrogen gas-storing apparatus or a gas-producing apparatus that produces a hydrogen-containing gas from a hydrocarbon fuel, and the above **polymer electrolyte** fuel **cell.**
USE - The electrode is used in **polymer electrolyte** fuel **cell** (claimed) e.g. used as a power source for driving various equipment including power generating equipment, such as a stationary generating facility and a portable generator, medical care equipment, such as a motorized wheelchair or walking-aid equipment, and also for electric automobiles.
ADVANTAGE - The electrode has simplified structure, high handling property, can be transferred precisely to a predetermined position, and enables automation of a production process.
DESCRIPTION OF DRAWING(S) - The figure is a sectional view of integral electrode for the **polymer electrolyte** fuel **cell.**
Electrolyte membrane 11
Electrode layers 12, 13
Reinforcing members 14
Sealing member 15
Dwg.1/11
FS CPI EPI
FA AB; GI
MC CPI: A12-E06A; A12-E06B; L03-E04A2
EPI: X16-C; X16-C01C; X16-C16; X16-E06; X16-F02; X21-A01F; X21-B01A

L49 ANSWER 12 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-492250 [46] WPIX
DNN N2003-390990
TI Fuel cell **stack**, has cell units arranged symmetrically, membrane electrode assembly interposed between anode and cathode and port to

supply reactant **gases** to cell unit.

DC X16
IN HAYASHI, K; KATO, H; OKAMOTO, H
PA (HOND) HONDA GIKEN KOGYO KK; (HOND) HONDA MOTOR CO LTD
CYC 4
PI US 2003044657 A1 20030306 (200346)* 14p H01M008-06
CA 2400452 A1 20030228 (200353) EN H01M008-24
JP 2003068349 A 20030307 (200353) 9p H01M008-24
DE 10239496 A1 20030918 (200369) H01M008-24
ADT US 2003044657 A1 US 2002-232086 20020829; CA 2400452 A1 CA 2002-2400452 20020828; JP 2003068349 A JP 2001-260399 20010829; DE 10239496 A1 DE 2002-10239496 20020828
PRAI JP 2001-260399 20010829
IC ICM H01M008-06; H01M008-24
ICS H01M008-04; H01M008-10
AB US2003044657 A UPAB: 20030820
NOVELTY - The cell **stack** has symmetrically arranged fuel cell units (12a, 12b) **stacked** together. Each cell unit has a pair of separators and a membrane electrode assembly interposed between the separators. The membrane electrode assembly has an ion exchange **membrane** made of **polymer electrolyte** and is interposed between anode (14a) and cathode (14b). The cell units are electrically connected in parallel.

DETAILED DESCRIPTION - Insulating plates (15) are **stacked** outside the cell unit (12b) and endplates (16a, 16b) are **stacked** outside the insulating plates. The cell units are fastened together to form cell fuel **stack**, by tightening the endplates with a tie rod. At the longitudinal end of endplate (16a), an oxygen-containing gas support (18a), a fuel gas discharge port (20b) is arranged.

USE - Used for power generation.

ADVANTAGE - The **supply** of reactant **gases** to the unit cells discharges the water, produced during the chemical reactions in end **stack** cell thereby resulting in efficient power generation in the cell system.

DESCRIPTION OF DRAWING(S) - The drawing shows the schematic perspective view showing a fuel **stack** system.

First and second fuel cell units 12a, 12b
Anode 14a
Cathode 14b
Insulating plates 15
Endplates 16a, 16b
Oxygen-containing gas support 18a
Gas discharge port. 20b

Dwg.1/8
FS EPI
FA AB; GI
MC EPI: X16-C01C; X16-E06A

L49 ANSWER 13 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2003-769894 [73] WPIX
DNN N2003-616809
TI **Polymer electrolyte** fuel **cell** used as

portable power source includes electrolyte membrane - electrode assembly with pair of electrodes provided with predetermined tightening pressure.

DC X16 X21

IN HASE, N; HATOH, K; KANBARA, T; KOBAYASHI, S; KUSAKABE, H; OHARA, H; TAKEGUCHI, S

PA (MATU) MATSUSHITA ELECTRIC IND CO LTD; (MATU) MATSUSHITA DENKI SANGYO KK

CYC 34

PI EP 1349228 A2 20031001 (200373)* EN 36p H01M008-24
R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR
CA 2423545 A1 20030926 (200374) EN H01M008-24
US 2003211376 A1 20031113 (200382) H01M008-10
JP 2004006280 A 20040108 (200405) 33p H01M008-24

ADT EP 1349228 A2 EP 2003-251897 20030326; CA 2423545 A1 CA 2003-2423545 20030326; US 2003211376 A1 US 2003-397811 20030325; JP 2004006280 A JP 2003-85583 20030326

PRAI JP 2002-85277 20020326

IC ICM H01M008-10; H01M008-24
ICS G01R031-36; H01M004-94; H01M008-02; H01M008-04

AB EP 1349228 A UPAB: 20031112
NOVELTY - Each unit cell of the cell **stack** includes an electrolyte membrane - electrode assembly comprising an hydrogen ion conductive **polymer electrolyte membrane** and a pair of electrodes. A pair of electrically **conductive separator plates** with respective gas flow channels, are in contact with the electrodes. Each electrode is provided with a tightening pressure of about 2to 4 kgF/cm2

DETAILED DESCRIPTION - INDEPENDENT CLAIMs are also included for the following:

(1) A method of manufacturing a **polymer electrolyte** fuel **cell**; and

(2) An inspection method.

USE - For portable power source and also for electric vehicle, cogeneration system etc.

ADVANTAGE - An improved inspection mode for inspecting MEAs is introduced, making it possible to efficiently manufacture fuel cells of high performance, stable, long term power generation. Micro short -circuits and/or hydrogen leak currents between electrodes are suppressed.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic front view, partial in cross section of a two cell **stacked** fuel cell.

Dwg.5/14

FS EPI

FA AB; GI

MC EPI: X16-C09; X21-A01F; X21-B04

L49 ANSWER 14 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN

AN 2003-459602 [44] WPIX

DNN N2003-365574 DNC C2003-122402

TI **Polymer electrolyte** fuel **cell**, for portable power source, electric vehicle and co generation system, includes pair of end plates made of electrically insulating resin-dominant material.

DC A85 L03 X16

IN HASE, N; HATOH, K; KOBAYASHI, S; KUSAKABE, H; OHARA, H; TAKEGUCHI, S; YAMAZAKI, T; SUGOU, M

PA (MATU) MATSUSHITA ELECTRIC IND CO LTD; (MATU) MATSUSHITA DENKI SANGYO KK; (HASE-I) HASE N; (HATO-I) HATOH K; (KOBA-I) KOBAYASHI S; (KUSA-I) KUSAKABE H; (OHAR-I) OHARA H; (SUGO-I) SUGOU M; (TAKE-I) TAKEGUCHI S; (YAMA-I) YAMAZAKI T

CYC 35

PI EP 1291951 A2 20030312 (200344)* EN 31p H01M008-24
R: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR
CA 2401915 A1 20030311 (200344) EN H01M008-24
CN 1405916 A 20030326 (200344) H01M008-10
JP 2003163026 A 20030606 (200346) 17p H01M008-24
KR 2003022723 A 20030317 (200350) H01M008-24
US 2003152819 A1 20030814 (200355) H01M008-10

ADT EP 1291951 A2 EP 2002-256260 20020910; CA 2401915 A1 CA 2002-2401915 20020906; CN 1405916 A CN 2002-131538 20020911; JP 2003163026 A JP 2002-264497 20020910; KR 2003022723 A KR 2002-54434 20020910; US 2003152819 A1 US 2002-238903 20020911

PRAI JP 2001-274606 20010911

IC ICM H01M008-10; H01M008-24
ICS H01M002-14; H01M008-00

AB EP 1291951 A UPAB: 20030710
NOVELTY - A **polymer electrolyte** fuel **cell** comprises a **cell stack** comprising electroconductive **separator plates** and electrolyte membrane-electrode assemblies, a pair of current collecting plates and a pair of end plates made of an electrically insulating resin-dominant material.

DETAILED DESCRIPTION - A **polymer electrolyte** fuel **cell** comprises:

(a) a cell **stack** comprising electroconductive **separator plates** and electrolyte membrane-electrode assemblies respectively sandwiched between neighboring **separator plates**, each of the electrolyte membrane-electrode assemblies comprises a pair of electrodes with a **polymer electrolyte membrane** sandwiched between the pair of electrodes;

(b) a pair of current collecting plates sandwiching the cell **stack**;

(c) a pair of end plates sandwiching the cell **stack** provided with the pair of current collecting plates;

(d) a tightening mechanism for tightening the pair of end plates to apply a tightening pressure to the cell **stack**; and

(e) **gas supply** and exhaust mechanism for supplying, to the cell **stack**, and exhausting, from the cell **stack**, an oxidant gas and a fuel **gas**, the **gas supply** and exhaust mechanism comprising an oxidant gas inlet, an oxidant gas outlet, a fuel gas inlet and a fuel gas outlet, and comprising an oxidant gas flow channel for connecting the oxidant gas inlet and the oxidant gas outlet and a fuel gas flow channel for connecting the fuel gas inlet and the fuel gas outlet.

The pair of end plates is made from an electrically insulating

resin-dominant material comprising resin as a main ingredient.

USE - The fuel cell is used for a portable power source, an electric vehicle and a co generation system.

ADVANTAGE - Reduced cost and weight, improved utilization of thermal energy and improved corrosion resistance.

DESCRIPTION OF DRAWING(S) - The figure shows a front view of the fuel cell.

Dwg.2/16

FS CPI EPI
FA AB; GI
MC CPI: A12-E06; L03-E04A2
EPI: X16-C01C

L49 ANSWER 15 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2003:659642 CAPLUS
DN 139:397806
ED Entered STN: 24 Aug 2003
TI Design, fabrication, and assembly of a **polymer electrolyte** membrane fuel **cell** (PEMFC)
AU Weber, Derek; Ibeh, Christopher C.
CS PSU/NSF-REU Summer 2002, USA
SO Annual Technical Conference - Society of Plastics Engineers (2003), 61st(Vol. 2), 2005-2009
CODEN: ACPED4; ISSN: 0272-5223
PB Society of Plastics Engineers
DT Journal; General Review
LA English
CC 52-0 (Electrochemical, Radiational, and Thermal Energy Technology)
AB A review. Design, fabrication, and assembly of a **Polymer Electrolyte** Membrane Fuel **Cell** (PEMFC) to maintain a low voltage source, near one volt, that runs at operating temps. near 80°, is presented. Creating a **stack** of cells will provide an energy solution that is more efficient than the system in place today. The PEMFC runs off of pure H and air (O) and will provide a power source that is nonpolluting and renewable since H is readily available through the electrolysis of H2O. The problems with this experiment are maintaining moisture control on both the cathode and anode and the other problem is in controlling the H **gas supply** since H is very explosive when combined with O. With these problems taken into consideration the PEMFC could be the energy source for the future.
ST review design fabrication assembly **polymer electrolyte** membrane fuel **cell**
IT Fuel cells
(discussion of design, fabrication, and assembly of **polymer electrolyte** membrane fuel **cells**)
RE.CNT 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anon; 216.51.18.233/fctypes.html
(2) Anon; www.compositestech.com P40
(3) Anon; www.fuelcellstore.com
(4) Anon; www.lynntechindustries.com
(5) Anon; www.plugpower.com

(6) Cook, B; An Introduction to Fuel Cells and Hydrogen Technology P1
(7) Goodman, S; Handbook of Thermoset Plastics, 2nd Edition 1998
(8) Ibeh, C; Thermoset Resins 2001
(9) Pyle, W; Home Power 1993, 35, P42
(10) Ramers, D; An Undergraduate Research Experience in New Technology Commercialization of PEM Fuel Cells, Session 1436

L49 ANSWER 16 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:793989 CAPLUS
DN 137:297442
ED Entered STN: 18 Oct 2002
TI **Polymer electrolyte** fuel **cell** and cooling system thereof
IN Yamazaki, Tatsuto; Hase, Nobuhiro; Kusakabe, Hiroki; Ohara, Hideo; Takeguchi, Shinsuke; Yamamoto, Yoshiaki
PA Matsushita Electric Industrial Co., Ltd., Japan; Sugou, Masayo
SO PCT Int. Appl., 67 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-10; H01M008-24
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002082573	A1	20021017	WO 2002-JP3315	20020402
	W: CN, JP, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	EP 1357624	A1	20031029	EP 2002-708775	20020402
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
	US 2003180590	A1	20030925	US 2003-392903	20030321
PRAI	JP 2001-104107	A	20010403		
	JP 2001-109140	A	20010406		
	JP 2001-142791	A	20010514		
	JP 2001-179194	A	20010613		
	WO 2002-JP3315	W	20020402		

AB The invention relates to a **polymer electrolyte** fuel **cell.** Conventionally, the output of a fuel cell may be lowered because of the difference among temps. of the cells at both ends of the fuel cell and the other cells due to heat dissipation from the end **plates.** A **polymer electrolyte** fuel **cell** of the invention is such that the lowering of the voltages of the cells nearest to the end **plates** is avoided without influencing the output voltages of the other cells. The **polymer electrolyte** fuel **cell** comprises a **cell stack** in which unit cells each composed of an anode, a cathode, and a **polymer electrolyte** film sandwiched between the anode and cathode are **stacked** with **conductive separator** sheets interposed between the unit cells, a pair of

current collector **plates** and a pair of end **plates** holding the cell **stack** and a passage for coolant for cooling the unit cells, which passage is disposed in part of the **conductive separator** sheets. At least the **conductive separator** sheet between one end **plate** and the unit cell nearest to the end plate has no coolant passage in it.

ST **polymer electrolyte** fuel **cell** cooling system

IT Solid state fuel **cells**
(**Polymer**; **polymer electrolyte** fuel **cell** cooling system)

IT Cooling apparatus
Fuel **cell** separators
(**polymer electrolyte** fuel **cell** cooling system)

RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Fuji Electric Co Ltd; JP 08-130028 A 1996 CAPLUS
(2) Mitsubishi Electric Corp; JP 10-340736 A 1998 CAPLUS
(3) Sanyo Electric Co Ltd; JP 2000277132 A 2000 CAPLUS
(4) Toshiba Corp; JP 05-159792 A 1993
(5) Toshiba Corp; JP 07-130388 A 1995
(6) Toshiba Corp; JP 08-7908 A 1996 CAPLUS
(7) Toyota Motor Corp; JP 08-130025 A 1996 CAPLUS

L49 ANSWER 17 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:754748 CAPLUS
ED Entered STN: 04 Oct 2002
TI High-**polymer electrolyte** fuel **cell**
IN Yamazaki, Tatsuto; Hase, Nobuhiro; Kusakabe, Hiroki; Ohara, Hideo; Takeguchi, Shinsuke; Yamamoto, Yoshiaki
PA Matsushita Electric Industrial Co., Ltd., Japan; Sugou, Masayo
SO PCT Int. Appl., 48 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM H01M008-02
ICS H01M008-24
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002078108	A1	20021003	WO 2002-JP2869	20020325
	W: CN, JP, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	EP 1357621	A1	20031029	EP 2002-708658	20020325
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
	US 2003157387	A1	20030821	US 2002-296513	20021126
PRAI	JP 2001-86987	A	20010326		
	JP 2001-106731	A	20010405		
	WO 2002-JP2869	W	20020325		

AB A fuel cell comprising a fuel **stack** including **conductive**

separator plates and an MEA (electrolyte film-electrode coupling) inserted between the **separator plates** and particularly an improvement of the **separator plate.** Conventionally, both front and rear main faces of each **separator plate** has a fuel gas circulation groove and an oxidizer gas circulation groove in the matching positions of both the gas circulation grooves. Therefore, the miniaturization of the fuel cell has caused the probem that the groove bottom between by both the gas circulation grooves of each **separator plate** needs to be thin and gas leakage by break of the thin part and difficulty in formation of the thin part may be caused. This invention makes it possible to avoid a thin part of a **separator plate** by matching the position of the gas circulation groove on one main face with that of a rib on the other main face of each **separator plate**, thereby solving the problem.

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Asahi Glass Co Ltd; JP 10255823 A 1998 CAPLUS
(2) Asahi Glass Co Ltd; JP 11162479 A 1999 CAPLUS
(3) Hitachi Chemical Co Ltd; JP 11354138 A 1999 CAPLUS
(4) Honda Motor Co Ltd; JP 200021434 A 2000
(5) Matsushita Electric Industrial Co Ltd; JP 2000133291 A 1999 CAPLUS
(6) Matsushita Electric Industrial Co Ltd; EP 951086 A2 1999 CAPLUS
(7) Riken Corp; JP 2000182640 A 2000 CAPLUS
(8) Toshiba Corp; JP 11354142 A 1999 CAPLUS

L49 ANSWER 18 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:696309 CAPLUS
DN 137:204022
ED Entered STN: 13 Sep 2002
TI Method of supplying reaction gas in fuel **cell** of solid **polymer electrolyte** fuel **cell** assembly
IN Sugiura, Seiji; Wariishi, Yoshinori; Sugita, Narutoshi; Enjoji, Naoyuki
PA Honda Giken Kogyo Kabushiki Kaisha, Japan; Honda Motor Co., Ltd.
SO PCT Int. Appl., 108 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M008-24
ICS H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002071526	A2	20020912	WO 2002-JP2012	20020305
	WO 2002071526	A3	20030904		
	W: AU, BR, CA, CN, ID, IN, KR, MX, PH, PL, RU, TR, US, VN				
	RW: AT, BE, CH, DE, ES, FI, FR, GB, IT, SE				
	JP 2002260710	A2	20020913	JP 2001-61516	20010306
	EP 1371107	A2	20031217	EP 2002-701724	20020305
	R: AT, BE, CH, DE, ES, FR, GB, IT, LI, SE, SI, LT, LV, FI, RO, MK, AL				
PRAI	JP 2001-61516	A	20010306		

WO 2002-JP2012 W 20020305

AB A cell assembly includes a first unit cell and a second unit cell which are **stacked** to each other. The first unit cell has a first unified body, and the second unit cell has a second unified body. A plurality of oxidizing gas passages and a plurality of fuel gas passages are provided in the cell assembly. The oxidizing gas passages in the first unit cell and the oxidizing gas passages in the second unit cell are communicated in series to each other. The fuel gas passages in the first unit cell and the fuel gas passages in the second unit cell are communicated in series to each other.

ST fuel cell **stack** reaction **gas supply** method

IT Fuel gases
Oxidizing agents
Solid state fuel cells
(method of supplying reaction gas in fuel **cell** of solid **polymer electrolyte** fuel **cell** assembly)

L49 ANSWER 19 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:143089 CAPLUS
DN 136:170339
ED Entered STN: 22 Feb 2002
TI **Polymer electrolyte** type fuel **cell**
IN Ohara, Hideo; Kusakabe, Hiroki; Yamazaki, Tatsuto; Hase, Nobuhiro; Takeguchi, Shinsuke; Yamamoto, Yoshiaki; Matsumoto, Toshihiro; Fujii, Satoru; Hatoh, Kazuhito; Hosaka, Masato; Niikura, Junji; Nishida, Kazufumi; Kanbara, Teruhisa
PA Matsushita Electric Industrial Co., Ltd., Japan
SO PCT Int. Appl., 71 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM H01M008-02
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002015312	A1	20020221	WO 2001-JP6955	20010810
	W: CN, JP, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	EP 1246282	A1	20021002	EP 2001-955684	20010810
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
	US 2003003345	A1	20030102	US 2002-118628	20020409

PRAI JP 2000-247808 A 20000817
JP 2000-247809 A 20000817
JP 2000-249339 A 20000821
JP 2000-317437 A 20001018
WO 2001-JP6955 W 20010810

AB The invention relates to a **polymer electrolyte** type fuel **cell** comprising a hydrogen ion conductive **polymer**

electrolyte film, an anode and a cathode holding the hydrogen ion conductive **polymer electrolyte** film therebetween, an anode side **conductive separator plate** having a gas flow channel for feeding fuel gas to the anode, and a cathode side **conductive separator plate** having a gas flow channel for feeding oxidant gas to the cathode, wherein the anode side and cathode side **conductive separator plates** are rectangular with one longer side having inlet side oxidant gas manifold holes disposed therein and the other longer side having outlet side oxidant gas manifold holes disposed therein, and fuel gas manifold holes and **cooling water** manifold holes have their inlets and outlets resp. disposed on the different shorter sides so that the fuel gas manifold holes are opposed to the **cooling water** manifold holes. And the oxidant gas manifold hole, fuel gas manifold hole and **cooling water** manifold hole differ in the opening configuration from each other.

ST **polymer electrolyte** fuel **cell** separator

IT Polyethers, uses
RL: DEV (Device component use); USES (Uses)
(perfluoro, sulfone-containing; **polymer electrolyte** fuel **cell**)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(polyether-, perfluoro, sulfone-containing; **polymer electrolyte** fuel **cell**)

IT Fuel **cell** separators
Fuel **cells**
(**polymer electrolyte** fuel **cell**)

IT Carbon black, uses
RL: DEV (Device component use); USES (Uses)
(**polymer electrolyte** fuel **cell**)

IT Fluoropolymers, uses
RL: DEV (Device component use); USES (Uses)
(sulfone-containing; **polymer electrolyte** fuel **cell**)

IT 163294-14-2, Nafion 112
RL: DEV (Device component use); USES (Uses)
(**polymer electrolyte** fuel **cell**)

RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Aisin Seiki Co Ltd; JP 1055813 A 1998
(2) Aisin Seiki Co Ltd; JP 2001102072 A 2001 CAPLUS
(3) Fuji Xerox Co Ltd; JP 106513 A 1998
(4) Honda Motor Co Ltd; CD-ROM of the specification and drawings annexed to the request of Japanese Utility Model Application No 110449/1991 (Laid-open No 66875/1993) 1993, P5
(5) Matsushita Electric Ind Co Ltd; EP 1094535 A1 2000 CAPLUS
(6) Matsushita Electric Ind Co Ltd; JP 200021420 A 2000
(7) Mitsubishi Electric Corporation; JP 10223238 A 1998 CAPLUS
(8) Seiko Epson Corporation; JP 11271701 A 1999 CAPLUS
(9) Tanaka Kikinzoku Kogyo K K; JP 09283166 A 1997
(10) Tanaka Kikinzoku Kogyo K K; JP 935726 A 1997

(11) Toyota Motor Corporation; JP 08138692 A 1996 CAPLUS

L49 ANSWER 20 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:889421 CAPLUS
DN 137:355504
ED Entered STN: 22 Nov 2002
TI Proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers
IN Ding, Yi
PA USA
SO U.S. Pat. Appl. Publ., 6 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M008-04
ICS H01M008-10
NCL 429026000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 48
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002172848	A1	20021121	US 2001-861450	20010518
	US 6632555	B2	20031014		
PRAI	US 2001-861450		20010518		

AB The invention is an improved proton electrolyte membrane (PEM) fuel cell system suited for application in a vehicle operating in temps. below the f.p. of water. The invention eliminates the need for pure water channels within a fuel cell humidifier. Specifically, the present invention uses a closed coolant path within the fuel cell; a humidifier comprising a humidification fluid flow path and a fuel and air **gas supply** passage continuous in, through and out of the humidifier; the humidification fluid flow path and the fuel and air **gas supply** passage separated by a water permeable membrane that is impervious to organic materials allowing water from the humidification fluid flow path to enter the fuel and air **gas supply** passage; and the humidifier connected to the fuel cell by a humidified air and fuel passageway. The water permeable membrane can be a Keggin ions pillared α-ZrP composite material. In one embodiment, the coolant path can be configured to include a coolant pump and a heat exchanger. The **coolant** can be a **water** and organic material mixture (using, for example glycol) thus allowing coolant flow in temps. below the f.p.

ST proton electrolyte membrane fuel cell antifreeze coolant humidifier
IT **Polymers**, uses
RL: DEV (Device component use); USES (Uses)
(membrane; proton **electrolyte** membrane fuel **cell** with antifreeze coolant and humidifiers)
IT Fuel cells
(power plants; proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers)
IT Antifreeze

Coolants
Electric vehicles
Heat exchangers
Solid state fuel cells
(proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers)

IT Membranes, nonbiological
(water-permeable; proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers)

IT 107-21-1, Ethylene glycol, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(aqueous, coolant; proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers)

IT 7732-18-5, **Water**, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(glycol mixed with, **coolant**; proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers)

IT 13765-95-2, Zirconium phosphate
RL: DEV (Device component use); USES (Uses)
(α-, membrane; proton electrolyte membrane fuel cell with antifreeze coolant and humidifiers)

L49 ANSWER 21 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:488105 CAPLUS
DN 137:49714
ED Entered STN: 28 Jun 2002
TI Modular **polymer electrolyte** membrane unit fuel **cell** assembly and fuel cell **stack**
IN Foster, Ronald B.
PA USA
SO U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM H01M008-10
ICS H01M008-02
NCL 429030000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 2002081474	A1	20020627	US 2000-745566	20001226
	US 6500577	B2	20021231		
PRAI	US 2000-745566		20001226		

AB Disclosed is a **polymer electrolyte** membrane fuel **cell** assembly apparatus for receiving an inserted membrane electrode assembly (MEA). The apparatus includes modular features for connecting a plurality of fuel cells into a planar fuel cell "**stack**" capable of using ambient air to **supply** oxidant **gas** and dissipate heat and water vapor. The invention also facilitates convenient removal and replacement of individual cells or MEAs in a **stack** without disassembly of the entire **stack.**

ST **polymer electrolyte** membrane fuel **cell** **stack** module
IT Fuel **cell** electrodes
Fuel **cells**
(modular **polymer electrolyte** membrane unit fuel **cell** assembly and fuel cell **stack**)
IT Rubber, uses
RL: TEM (Technical or engineered material use); USES (Uses)
(modular **polymer electrolyte** membrane unit fuel **cell** assembly and fuel cell **stack**)

L49 ANSWER 22 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:886579 CAPLUS
DN 137:372559
ED Entered STN: 22 Nov 2002
TI Method for operation of **polymer-electrolyte** fuel **cell** power plant
IN Kato, Shigemi
PA Fuji Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002334711	A2	20021122	JP 2001-138427	20010509
PRAI	JP 2001-138427		20010509		

AB The title power plant is equipped with a plurality of fuel-cell **stacks** divided for full load operation and stopped power generation, where the process comprises supplying a fuel gas and an oxidizing gas at constant flow to the **stacks** for full load operation and stopping **supply** of a fuel **gas** and an oxidizing gas to the **stacks** for stopped power generation. The power plant is prevented from clogging of cells by water droplets.
ST **polymer electrolyte** fuel **cell** power plant operation
IT Fuel cells
(power plants; controlled **supply** of fuel **gas** and oxidizing gas in operation of **polymer-electrolyte** fuel **cell** power plant)

L49 ANSWER 23 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:812184 CAPLUS
DN 137:339955
ED Entered STN: 25 Oct 2002
TI Fuel cell system
IN Taniyama, Takeshi
PA Nissan Motor Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002313379	A2	20021025	JP 2001-112613	20010411
PRAI	JP 2001-112613		20010411		

AB The fuel **cell** system has a **polymer electrolyte** fuel **cell stack**, sep. pipes supplying a fuel gas and an oxidant gas to the fuel cell **stack**, humidifying means for either or both reaction **gases**, a pipe **supply** water for the humidifying means, and a means pressurizing the water supplied to the water supplying pipe; where a water tank is installed on the water supplying pipe near the inlet of the pressurizing means, the tank is connected to the fuel gas or oxidant supplying pipe, a valve in installed on the connection pipe controlling the flow of the gas to and from the tank, and a means adjusting the valve to raise the pressure in the tank when the system is operated at high load.
ST fuel cell reaction gas humidifying water pressure control
IT Fuel **cells**
Humidity
(**polymer electrolyte** fuel **cell** systems containing pressure adjustable water **supply** for reaction **gas** humidification)

L49 ANSWER 24 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:611873 CAPLUS
DN 137:143111
ED Entered STN: 16 Aug 2002
TI **Polymer electrolyte** fuel **cell** power plant and its operation method
IN Aoki, Makoto
PA Fuji Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-04; H01M008-06; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002231283	A2	20020816	JP 2001-22922	20010131
PRAI	JP 2001-22922		20010131		

AB The power plant has a **polymer electrolyte** fuel **cell stack**, means cooling the fuel cell **stack**,

means supplying a H containing fuel gas and air to the fuel cells in opposite directions, means monitoring water vapor partial pressure Pw in the cathode and anode off gases, means monitoring internal resistance of the cells, and a control system adjusting an air flow regulator, a fuel gas flow regulator, a coolant flow regulator, a coolant temperature regulator, and/or a operation c.d. regulator, when an abnormal wetting of the electrolyte membrane is detected, based on the rise of Pw in cathode off gas, the decrease of Pw in the anode off gas, and the rise of internal resistance. The power plant operation is controlled by decreasing air **supply**, increasing fuel **gas supply**, increasing coolant **supply**, lowering coolant temperature, lowering operation c.d., or increasing humidity of the fuel gas and air when an abnormal wetting of the electrolyte is monitored.

ST **polymer electrolyte** fuel **cell** structure operation control

IT Fuel cells
(power plants; structure and operation control of **polymer electrolyte** fuel **cell** power plant)

IT Process control
(structure and operation control of **polymer electrolyte** fuel **cell** power plant)

L49 ANSWER 25 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:364298 CAPLUS
DN 136:357484
ED Entered STN: 16 May 2002
TI **Polymer-electrolyte** fuel **cell** combined with thermoelectric transducer and fuel cell **stack**
IN Shirai, Katsuya
PA Sony Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-00
ICS H01M008-10; H01M008-24
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2002141077	A2	20020517	JP 2000-337643	20001106
PRAI	JP 2000-337643		20001106		

AB The title fuel cell is equipped with a proton-conducting **polymer electrolyte** membrane sandwiched with an anode and a cathode, an anode-side field plate and a cathode-side field plate having **gas** passages to **supply** an anode **gas** and a cathode gas, resp., and a thermoelec. transducer combined with one of the field plate to convert thermal energy at the cathode to elec. energy. The title **stack** is equipped with a plurality of the above fuel cells laminated through heat-insulating layers. The fuel cell provides high energy utilization.

ST **polymer electrolyte** fuel **cell** thermoelec

transducer combined **stack**
IT Solid state fuel **cells**
Thermoelectric devices
(**stacked polymer-electrolyte** fuel **cell** combined with thermoelec. transducer)

L49 ANSWER 26 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:104888 CAPLUS
DN 136:153898
ED Entered STN: 08 Feb 2002
TI **Polymer-electrolyte** fuel **cell**
IN Kabasawa, Akihiro; Kususe, Nobuhiko
PA Fuji Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-02
ICS H01M008-02; H01M008-10; H01M008-24; H01M008-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2002042833	A2	20020208	JP 2000-225289	20000726
PRAI JP 2000-225289		20000726		

AB The fuel cell, equipped with a **stack** containing a **polymer electrolyte** sandwiched with (A) catalyst electrode layers and (B) diffusion electrode layers to give an anode and a cathode, comprises separators having reaction gas passages facing to A and reaction **gas** passages, **gas-supply** passages, and **gas**-discharge passages facing to B. The fuel cell provides good electrolyte humidifying property.
ST **polymer electrolyte** fuel **cell**
IT Solid state fuel **cells**
(structure of **polymer-electrolyte** fuel **cell** for humidifying **electrolyte** membrane)

L49 ANSWER 27 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:693265 CAPLUS
DN 137:204001
ED Entered STN: 13 Sep 2002
TI Method of supplying reaction gas in solid **polymer electrolyte** fuel **cell** assembly
IN Sugiura, Seiji; Wariishi, Yoshinori; Enjoji, Naoyuki; Sugita, Narutoshi
PA Honda Giken Kogyo Kabushiki Kaisha, Japan
SO Eur. Pat. Appl., 26 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM H01M008-24
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1239530	A2	20020911	EP 2002-4962	20020305
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
	JP 2002260689	A2	20020913	JP 2001-61527	20010306
	US 2002146601	A1	20021010	US 2002-93235	20020306
PRAI	JP 2001-61527	A	20010306		

AB A fuel cell assembly includes a first unit cell and a second unit cell **stacked** to each other. The first unit cell includes a first unified body, and the second unit cell includes a second unified body. In the cell assembly, oxidizing gas passages and fuel gas passages and are provided in parallel along the first and second unit cells.

ST **polymer electrolyte** fuel **cell** assembly reaction **gas supply**

IT Solid state fuel cells
(method of supplying reaction gas in solid **polymer electrolyte** fuel **cell** assembly)

L49 ANSWER 28 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2002:169253 CAPLUS
DN 136:219522
ED Entered STN: 08 Mar 2002
TI Impregnated carbon fiber fabrics for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**
IN Zuber, Ralf; Bayer, Armin; Kuehnhold, Heike; Stenke, Udo
PA DMC2 Degussa Metals Catalysts Cerdec A.-G., Germany
SO Eur. Pat. Appl., 13 pp.
CODEN: EPXXDW
DT Patent
LA German
IC ICM H01M008-10
ICS H01M008-24; H01M008-02
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 1184925	A2	20020306	EP 2001-119314	20010810
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
	DE 10042744	A1	20020328	DE 2000-10042744	20000831
	US 2002051901	A1	20020502	US 2001-933121	20010821
	JP 2002110198	A2	20020412	JP 2001-258420	20010828
	BR 2001003791	A	20020507	BR 2001-3791	20010830
PRAI	DE 2000-10042744	A	20000831		

AB A **polymer electrolyte** membrane (PEM) fuel **cell stack** comprises ≥1 fuel cells with membrane electrode units, which are arranged between 2 elec. conductive bipolar plates. The bipolar plates are provided with partial-opened flow channels used for the **supply** of reactive **gases.** The membrane electrode unit

consists of a **polymer electrolyte** membrane which is in contact to a reaction layer on both sides. A compressible, coarsely-porous gas diffusion layer consisting of **polymer** -impregnated carbon fiber fabrics is placed between each reaction layer, and bipolar plate.

ST fuel **cell stack polymer electrolyte** membrane; impregnated carbon fiber gas diffusion electrode; gas diffusion electrode fuel cell; **polymer** impregnated carbon fabric gas diffusion electrode

IT Fluoropolymers, uses
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aqueous suspension, Hostaflon TF 5235; in impregnation for carbon fiber fabrics for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**)

IT Carbon fibers, uses
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(fabrics, AvCarb 1071HCB; for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**)

IT Fuel cell electrodes
(gas diffusion; impregnated carbon fiber fabrics for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**)

IT Fuel cells
Polymer electrolytes
(impregnated carbon fiber fabrics for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**)

IT Fuel **cell electrolytes**
Fuel **cell** separators
(**polymer electrolyte** membrane; impregnated carbon fiber fabrics for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**)

IT 9002-84-0, PTFE
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)
(aqueous suspension, Hostaflon TF 5235; in impregnation for carbon fiber fabrics for gas diffusion electrode of **polymer electrolyte** membrane fuel **cell stacks**)

L49 ANSWER 29 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2002-426630 [45] WPIX
DNN N2002-335481 DNC C2002-120980
TI Supplying of hydrogen gas stream to fuel cell anode, involves introducing feed gas stream to adsorption module having chemically distinct adsorbents which adsorb contaminant to produce pure hydrogen gas stream.
DC E36 J01 J04 L03 Q14 X16

IN KEEFER, B; ROY, S; SAWADA, J; BROWN, M; JOHANNES, E; BROWN, M J; JOHANNES, E P; KEEFER, B G; SAWADA, J A

PA (QUES-N) QUESTAIR TECHNOLOGIES INC; (BROW-I) BROWN M J; (JOHA-I) JOHANNES E P; (KEEF-I) KEEFER B G; (ROYS-I) ROY S; (SAWA-I) SAWADA J A

CYC 98

PI WO 2002035623 A2 20020502 (200245)* EN 55p H01M008-00
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
CA 2324699 A1 20020427 (200245) EN H01M008-06
CA 2324702 A1 20020427 (200245) EN H01M008-06
US 2002098394 A1 20020725 (200254) H01M008-04
AU 2002014858 A 20020506 (200257) H01M008-00
EP 1344270 A2 20030917 (200362) EN H01M008-06
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

ADT WO 2002035623 A2 WO 2001-CA1523 20011026; CA 2324699 A1 CA 2000-2324699 20001027; CA 2324702 A1 CA 2000-2324702 20001027; US 2002098394 A1 US 2001-39552 20011026; AU 2002014858 A AU 2002-14858 20011026; EP 1344270 A2 EP 2001-983346 20011026, WO 2001-CA1523 20011026

FDT AU 2002014858 A Based on WO 2002035623; EP 1344270 A2 Based on WO 2002035623

PRAI CA 2000-2324702 20001027; CA 2000-2324699 20001027

IC ICM H01M008-00; H01M008-04; H01M008-06
ICS B60L011-18; H01M008-10; H01M008-22

AB WO 200235623 A UPAB: 20020717

NOVELTY - A feed gas stream containing hydrogen and a contaminant is introduced into adsorption module having adsorbents (A,B), steam reforming catalyst and water gas shift reaction catalyst. The adsorbents are chemically distinct, and one of the adsorbent (A or B) adsorbs contaminant in feed gas stream to produce purified gas stream of hydrogen. The purified stream is introduced to a fuel cell anode.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

(1) separation of carbon monoxide from gas stream containing hydrogen, involves introducing the feed stream to the rotary pressure swing adsorption module for separating portion(s) of carbon monoxide, and introducing purified gas stream to fuel cell anode;

(2) electrical current generating system which has a gas source containing hydrogen, at least one adsorption module which partially purifies the gas, and at least one fuel cell defining an anode inlet for receiving purified gas stream from the adsorption module;

(3) system for supplying hydrogen gas to fuel cell anode which has hydrogen gas generating system having outlet for discharging gas containing hydrogen and contaminants, respective contaminant separation zones, and fuel cell anodes which is attached to the outlet of contaminant (B) separation zone; and

(4) process for providing gas stream containing hydrogen and oxygen-enriched gas stream to fuel cell which involves introducing the

oxygen-enriched gas stream and purified hydrogen gas stream into fuel cell, introducing separation exhaust gas stream as fuel into combustion engine for driving devices such as compressors, vacuum pumps or electric generator.

USE - For providing gas stream containing hydrogen to fuel cell anode, used for electric power generation, particularly for vehicle propulsion and for small scale stationary power generation.

ADVANTAGE - Purification of reformate hydrogen, energy-efficient pressure swing adsorption system (PSA) oxygen enrichment, heat recovery from the fuel cell **stack** and from combustion of hydrogen PSA tail gas, and thermal powering of air compression for the oxygen PSA and of any PSA vacuum pumping are performed so as to minimize the size of the fuel cell **stack** while maximizing overall energetic efficiency of energy conversion from the raw fuel. The hydrogen **gas** delivery system **supplies** purified hydrogen **gas** to the anode gas inlet, and recirculate hydrogen gas from anode gas exit back to anode gas inlet with increased purity so as to avoid accumulation of impurities in the anode channel. Even when high hydrogen purity is specified for the PSA, a small bleed from the end of the anode channel back to the feed pressurization step of the hydrogen PSA is avoided. The accumulation of contaminant due to equipment imperfections or operational transient upsets, is eliminated.

DESCRIPTION OF DRAWING(S) - The figure shows an axial section of the rotary pressure swing adsorption systems module.

PSA module 1

Dwg.1/9

FS CPI EPI GMPI

FA AB; GI; DCN

MC CPI: E31-A03; J01-E03D; J01-E03E; J04-E01; L03-E04
EPI: X16-C15

L49 ANSWER 30 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2

AN 2001:868867 CAPLUS

DN 136:9095

ED Entered STN: 30 Nov 2001

TI Method of controlling **polymer electrolyte** fuel **cell** system

IN Saito, Kazuo

PA Nissan Motor Co., Ltd., Japan

SO PCT Int. Appl., 27 pp.
CODEN: PIXXD2

DT Patent

LA English

IC ICM H01M008-04

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 48

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001091216	A2	20011129	WO 2001-JP3275	20010417
	WO 2001091216	A3	20020530		

W: CN, KR, US

RW: DE, FR, GB
JP 2001332280 A2 20011130 JP 2000-151962 20000523
EP 1287574 A2 20030305 EP 2001-919976 20010417
R: DE, FR, GB, SI, LT, LV, RO, MK, AL
US 2002106537 A1 20020808 US 2002-31368 20020118
PRAI JP 2000-151962 A 20000523
WO 2001-JP3275 W 20010417
AB In a fuel cell system and its controlling method, the fuel cell system includes a **stack** including fuel **cells** each having a **polymer electrolyte** membrane, and a controller. The controller is responsive to detected outputs of a displacement sensor and a temperature sensor and controls such that, when the **polymer electrolyte** membrane is discriminated to remain in an excessively dry state, a shut-off valve is applied with a "close" control signal to interrupt the **supply** of fuel **gas** to the **stack** and, concurrently, a shut-off valve is applied with an "open" control signal to allow air to be supplied to the **stack** while applying a pump control signal to a pump so as to maximize its rotational speed for thereby increasing the flow rate of pure water to be circulated to the humidifier from a pure water tank. Simultaneously, a timer of the controller is operated to begin counting an incremental time. As a result, air is excessively humidified by the humidifier and is supplied to the **stack** via the shut-off valve.
ST control **polymer electrolyte** fuel **cell** system
IT Control apparatus
Fuel **cells**
Process control
(method of controlling **polymer electrolyte** fuel **cell** system)

L49 ANSWER 31 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2001:579469 CAPLUS
DN 135:125063
ED Entered STN: 10 Aug 2001
TI Fuel cell power plants and their operation method
IN Aoki, Makoto
PA Fuji Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2001216990	A2	20010810	JP 2000-27618	20000204
PRAI	JP 2000-27618		20000204		

AB The power plants have an operational fuel cell **stack**, and a smaller monitoring **polymer electrolyte** fuel **cell**, supplied with the same reaction gas as for the fuel cell

stack and operated at a higher c.d. than the **stack**. The power plants are operated by cutting off reaction **gas supply** to the fuel cell **stack**, when the output of the monitoring cell drops below a 1st predetd. value, and resuming reaction **gas supply** when the output of the monitoring cell rises beyond a 2nd predetd. value higher than the 1st value.

ST fuel cell power plant operation monitoring cell

IT Fuel cells
(power plants; fuel **cell** power plants containing small **polymer electrolyte** monitoring fuel **cell** for operation control)

L49 ANSWER 32 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2001-168377 [17] WPIX
DNN N2001-121446
TI High temperature membrane (HTM) fuel-cell installation - uses preheating device for preheating oxidant and for pre-heating at least one process gas independently of HTM fuel-cell unit operation.
DC X16
IN BALDAUF, M; BRUECK, R; HELMOLT, R V; KONIECZNY, J; POPPINGER, M; REIZIG, M; BUCHNER, P; GROSSE, J; MATTEJAT, A; MEHLTRETTER, I; MUND, K; WAIDHAS, M; VON HELMOLT, R
PA (EMIT-N) EMITEC GES EMISSIONSTECHNOLOGIE MBH; (SIEI) SIEMENS AG
CYC 22
PI WO 2001003218 A1 20010111 (200117)* DE 20p H01M008-04
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
W: CA CN JP US
DE 19930874 A1 20010118 (200124) H01M008-04
DE 19962683 A1 20010628 (200138) H01M008-04
ADT WO 2001003218 A1 WO 2000-DE2162 20000703; DE 19930874 A1 DE 1999-19930874 19990705; DE 19962683 A1 DE 1999-19962683 19991223
PRAI DE 1999-19962683 19991223; DE 1999-19930874 19990705
IC ICM H01M008-04
ICS H01M008-22
AB WO 200103218 A UPAB: 20010328
A HTM fuel-cell installation has at least one HTM-fuel cell unit and at least one process **gas supply**- and removal-channel, in which at least one device is provided for pre-heating the process gas before the gas enters the inlet to the reaction chamber of a HTM-fuel cell unit.

The pre-heating device specifically pre-heats the oxidant, and is operated to pre-heat at least one process gas independently of the operation of the HTM-fuel cell unit, and can thus be used to pre-heat the fuel-cell **stack** to the working temperature.

USE - **Polymer electrolyte membrane** (PEM) fuel **cell** arrangements.

ADVANTAGE - Non-humidified process gas streams along **stack** at operating temperature and/or is capable of preheating **stack** to operating temperature after rest phase.

Dwg.1/3
FS EPI
FA AB; GI

MC EPI: X16-C01C; X16-C09; X16-K

L49 ANSWER 33 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2001-427808 [46] WPIX
DNN N2001-317336 DNC C2001-129774
TI Solid high molecular form fuel cell, has reactive **gas supply** stream, humidifier, inert **gas supply** unit, controller and separator of unit battery circulating gas before generating electricity by controller.
DC A85 L03 X16
PA (TOKE) TOSHIBA KK
CYC 1
PI JP 2001118587 A 20010427 (200146)* 11p H01M008-02
ADT JP 2001118587 A JP 1999-293560 19991015
PRAI JP 1999-293560 19991015
IC ICM H01M008-02
ICS H01M008-04; H01M008-10; H01M008-24
AB JP2001118587 A UPAB: 20010815
NOVELTY - Fuel cell has reactive **gas supply** system (RGS) **supplies** reactive **gas** to fuel electrode and oxidizing agent electrode of membrane electrode composite, humidifiers (37a, 37b), inert **gas supply** unit (40) switchably connected to RGS, and controller (41) controlling operation of (37a,37b) and (40). Separator of unit battery circulates gas containing water or water vapor before generating electricity by (41).

DETAILED DESCRIPTION - The fuel cell is equipped with **membrane** electrode composite comprising solid **polymer electrolyte** film, fuel electrode and oxidizing agent electrode, pinched to support, and fuel cell **stack** (18) comprising laminate of unit battery consisting of separator which **supplies** reactive **gas** to fuel electrode and oxidizing agent electrode, in electric series. The humidifier supplies saturated steam to oxidizing agent **gas supply** pipe and heating **gas supply** pipe. An INDEPENDENT CLAIM is also included for operating method of solid high molecular form fuel cell.

USE - For electricity generation system.

ADVANTAGE - The pressure loss in the separator is equalized. The shut down of the system, is prevented. Equalization of **supply** of reactive **gas**, is enabled. Stable electricity generation is performed.

DESCRIPTION OF DRAWING(S) - The figure shows the structure of solid high molecular form fuel cell. (The drawing includes non-English language text).

Solid high molecular form fuel cell **stack** 18
Humidifiers 37a, 37b
Inert **gas supply** unit 40
Controller 41
Dwg.1/8
FS CPI EPI
FA AB; GI
MC CPI: A99-A; L03-E04
EPI: X16-C01; X16-C09

L49 ANSWER 34 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:861970 CAPLUS
DN 134:19403
ED Entered STN: 08 Dec 2000
TI **Polymer electrolyte** fuel **cells** and their operation method
IN Sakai, Osamu; Gyoten, Hisaaki; Hatoh, Kazuhito; Yasumoto, Eiichi; Nishida, Kazufumi; Uchida, Makoto; Ohara, Hideo; Sugawara, Yasushi; Morita, Junji; Matsumoto, Toshihiro; Kanbara, Teruhisa
PA Matsushita Electric Industrial Co., Ltd., Japan
SO PCT Int. Appl., 27 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM H01M008-24
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000074165	A1	20001207	WO 2000-JP3275	20000522
	W: CN, JP, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 1195831	A1	20020410	EP 2000-927842	20000522
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
PRAI	JP 1999-149895	A	19990528		
	WO 2000-JP3275	W	20000522		

AB The fuel cells have unit **cells**, containing a **polymer electrolyte** membrane, an electrode pair holding the membrane, and **conductive separators** having reaction gas passages at least on 1 side holding the electrode-electrolyte assembly, **stacked** with **retaining plates** and pressed; where the **retaining plates** form voids between the unit cells, and cell modules containing ≥1 unit cells between the **retaining plates** can be removed from the **stack** . During the operation of the fuel cells, the voltages of individual unit cells or cell modules are monitored, and when the monitored voltage of a cell or module falls below a predetd. level, that cell or module is replaced.
ST **polymer electrolyte** fuel **cell stack** structure operation
IT Fuel cells
(structure of **polymer** fuel cell **stacks** for replacing deteriorated unit cells or cell modules during operation)
RE.CNT 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Fuji Electric Co Ltd; JP 6316576 A 1988
(2) Fuji Electric Co Ltd; JP 822837 A 1996
(3) Fuji Electric Co Ltd; JP 837012 A 1996

(4) Fuji Electric Co Ltd; JP 10308227 A 1998 CAPLUS
(5) Siemens Aktiengesellschaft; WO 9522179 A1 1995 CAPLUS
(6) United Technologies Corporation; US 4198597 A 1980
(7) United Technologies Corporation; US 4198597 A 1980

L49 ANSWER 35 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:227922 CAPLUS
DN 132:239467
ED Entered STN: 07 Apr 2000
TI Fuel cell **stack** with separator of a laminate structure
IN Matsumoto, Toshihiro; Hatoh, Kazuhito; Gyoten, Hisaaki; Kanbara, Teruhisa; Nishida, Kazufumi; Ohara, Hideo
PA Matsushita Electric Industrial Co., Ltd., Japan
SO PCT Int. Appl., 35 pp.
CODEN: PIXXD2
DT Patent
LA English
IC ICM H01M008-02
ICS H01M008-24
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2000019555	A1	20000406	WO 1999-JP5151	19990920
	W: CN, KR, US				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	JP 2000100457	A2	20000407	JP 1998-270861	19980925
	EP 1116295	A1	20010718	EP 1999-943448	19990920
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	US 6689504	B1	20040210	US 2001-786728	20010308
PRAI	JP 1998-270861	A	19980925		
	WO 1999-JP5151	W	19990920		

AB The present invention provides a fuel cell **stack** including a plurality of unit cells laid one upon another. Each of the unit cells includes an electrolyte, a pair of electrodes that are arranged across the electrolyte and resp. have a catalytic reaction layer, and a separator having means for feeding a supply of gaseous fuel to one of the electrodes and a **supply** of oxidant **gas** to the other of the electrodes. The separator is a laminate including a gas-tight conductive plate A and another conductive plate B having at least one slit, which continuously meanders from one end to another end of the conductive plate B. The technique of the present invention gives a compact fuel cell **stack** assembly by a simple process.
ST fuel cell **stack** separator laminate structure
IT Fuel cell separators
(fuel cell **stack** with separator of laminate structure)
IT Phenolic resins, uses
Polyesters, uses
RL: DEV (Device component use); USES (Uses)

(fuel cell **stack** with separator of laminate structure)
IT Fuel **cells**
(**polymer electrolyte**; fuel **cell**
stack with separator of laminate structure)
IT 7440-06-4, Platinum, uses
RL: CAT (Catalyst use); DEV (Device component use); USES (Uses)
(fuel cell **stack** with separator of laminate structure)
IT 7440-44-0, Carbon, uses 11107-04-3, Sus 316 25038-59-9, Polyethylene terephthalate, uses 25189-22-4, ButaDiene-ethylene-propylene terpolymer
RL: DEV (Device component use); USES (Uses)
(fuel cell **stack** with separator of laminate structure)
RE.CNT 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Ballard Power Systems; WO 9850973 A 1998 CAPLUS
(2) Harry, M; US 5683828 A 1997 CAPLUS
(3) Juelich, K; DE 19734729 C 1998
(4) Mitsubishi Heavy Ind Ltd; JP 04267062 A 1992 CAPLUS
(5) Mitsubishi Heavy Ind Ltd; JP 05029001 A 1993
(6) Mitsubishi Heavy Ind Ltd; JP 05109415 A 1993
(7) Mitsubishi Heavy Ind Ltd; JP 06333580 A 1994 CAPLUS
(8) Mitsubishi Heavy Ind Ltd; JP 07240218 A 1995 CAPLUS
(9) Nichols, B; US 3484298 A 1969 CAPLUS
(10) Tanaka Kikinzoku Kogyo Kk; JP 09204924 A 1997 CAPLUS
(11) Washington, K; US 5300370 A 1994

L49 ANSWER 36 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 2000:274702 CAPLUS
DN 132:281645
ED Entered STN: 28 Apr 2000
TI Solid **polymer electrolyte** fuel **cells**
IN Nishihara, Hironori
PA Fuji Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-24
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2000123857	A2	20000428	JP 1998-291828	19981014
PRAI	JP 1998-291828		19981014		

AB The fuel cells containing unit cells, having a cathode and an anode on the opposite sides of a **polymer electrolyte** membrane, **stacked** alternately with **separators**, pressing **plates** at the ends of the **stack** and tie rods fastening the plates and the **stack**, and manifolds extending the **stacking** direction to **supply** reaction **gases**; where the tie rods are inserted inside the manifolds with the part inside the manifolds coated with an insulator layer.

ST **polymer electrolyte** fuel **cell stack**
fastening structure
IT Fuel **cells**
(structure of fasteners for **polymer electrolyte** fuel **cells**)

L49 ANSWER 37 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 2000-256445 [22] WPIX
DNN N2000-190703 DNC C2000-078188
TI Fuel cell system includes a fuel cell **stack** comprising fuel cells having membrane-electrode assemblies that are hydrated with liquid water, and bipolar plates for distributing hydrogen fuel gas and water.
DC L03 X16
IN WILSON, M S
PA (REGC) UNIV CALIFORNIA
CYC 85
PI WO 2000011745 A1 20000302 (200022)* EN 28p H01M008-04
RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW
W: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZA ZW
AU 9957717 A 20000314 (200031)
US 6117577 A 20000912 (200046)
EP 1110264 A1 20010627 (200137) EN H01M008-04
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI
EP 1110264 B1 20030402 (200325) EN H01M008-04
R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
DE 69906551 E 20030508 (200338) H01M008-04
ADT WO 2000011745 A1 WO 1999-US17573 19990803; AU 9957717 A AU 1999-57717 19990803; US 6117577 A US 1998-135965 19980818; EP 1110264 A1 EP 1999-945013 19990803, WO 1999-US17573 19990803; EP 1110264 B1 EP 1999-945013 19990803, WO 1999-US17573 19990803; DE 69906551 E DE 1999-606551 19990803, EP 1999-945013 19990803, WO 1999-US17573 19990803
FDT AU 9957717 A Based on WO 2000011745; EP 1110264 A1 Based on WO 2000011745; EP 1110264 B1 Based on WO 2000011745; DE 69906551 E Based on EP 1110264, Based on WO 2000011745
PRAI US 1998-135965 19980818
IC ICM H01M008-04
ICS H01M008-02
AB WO 200011745 A UPAB: 20000508
NOVELTY - Ambient pressure fuel cell system includes a fuel **stack** comprising fuel cells having membrane/electrode assemblies (MEA's) (24) that are hydrated with liquid water, and bipolar plates (26) with anode and cathode channels for respectively distributing hydrogen fuel gas and water to the anode side and air with reactant oxygen to a cathode side.
DETAILED DESCRIPTION - Ambient pressure fuel cell system includes a fuel **stack** comprising of fuel cells having membrane/electrode assemblies (MEA's) that are hydrated with liquid water, and bipolar plates with anode and cathode channels for respectively distributing hydrogen

fuel gas and water to the anode side and air with reactant oxygen to a cathode side. The system also includes a liquid water supply to the fuel cells for hydrating the MEA's, a hydrogen fuel **gas supply**, and near-ambient pressure blower for blowing air in excess of reaction stoichiometric amounts through the fuel cell **stack** to provide oxygen for electrochemical reaction at the cathode side.

An INDEPENDENT CLAIM is also included for a method of operating a fuel cell **stack** at ambient pressure.

USE - The system of this invention is useful as hydrogen-oxygen fuel **cells**, and more particularly, to **polymer electrolyte membrane** fuel **cells.**

ADVANTAGE - The system of this invention has fully hydrated membranes that overcomes the problems inherent in pressurized fuel cells using humidified reactant gases. The system of this invention uses direct liquid hydration at ambient pressure to produce a simple, low-parasitic power system and to provide direct evaporative-cooling from high volume ambient pressure air flow.

DESCRIPTION OF DRAWING(S) - Figure showing a cross-section of a unit cell defecting an ambient fuel cell system of this invention.

Flow field 12

Membrane/electrode assemblies 24

Bipolar plates 26

Dwg.1/7

FS CPI EPI

FA AB; GI

MC CPI: L03-E04

EPI: X16-C01C; X16-E06A

L49 ANSWER 38 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN

AN 2000-163151 [15] WPIX

DNN N2000-121864 DNC C2000-051107

TI **Polymer electrolyte** fuel **cell** for portable power sources, electric vehicle power sources and domestic co-generation systems has reliable unit cell **stack** fastening mechanism.

DC A85 L03 X16

IN GYOTEN, H; HATOH, K; KANBARA, T; MATSUMOTO, T; NAKAGAWA, K; NISHIDA, K; OHARA, H; SUGAWARA, Y; UCHIDA, M; YASUMOTO, E

PA (MATU) MATSUSHITA ELECTRIC IND CO LTD; (MATU) MATSUSHITA DENKI SANGYO KK

CYC 28

PI EP 981174 A2 20000223 (200015)* EN 22p H01M008-24

R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI

JP 2000067887 A 20000303 (200023) 7p H01M008-02

JP 2000067902 A 20000303 (200023) 6p H01M008-24

JP 2000067903 A 20000303 (200023) 8p H01M008-24

CN 1245981 A 20000301 (200029) H01M008-10

US 6210823 B1 20010403 (200120) H01M008-02

JP 3420508 B2 20030623 (200341) 7p H01M008-24

ADT EP 981174 A2 EP 1999-116104 19990817; JP 2000067887 A JP 1998-234501 19980820; JP 2000067902 A JP 1998-233153 19980819; JP 2000067903 A JP 1998-234371 19980820; CN 1245981 A CN 1999-118054 19990819; US 6210823 B1 US 1999-374517 19990816; JP 3420508 B2 JP 1998-234501 19980820

FDT JP 3420508 B2 Previous Publ. JP 2000067887
PRAI JP 1998-234501 19980820; JP 1998-233153 19980819; JP 1998-234371 19980820
IC ICM H01M008-02; H01M008-10; H01M008-24
ICS H01M008-10
AB EP 981174 A UPAB: 20030915
NOVELTY - A device (39) restrains a first member on one end of an assembly including unit cell **stack**, first and second end **plates**, and at least one auxiliary plate (33, 34), and a second member on other end. Screw (35) is fitted in auxiliary plate such that the screw end contacts the first end plate. Compressive device compresses the unit cell **stack** when the screw is fitted in auxiliary plate threaded hole.

DETAILED DESCRIPTION - The **polymer electrolyte** fuel **cell** comprises:

a fuel cell **stack**, each **cell** comprising a **polymer electrolyte membrane**, anode and cathode arranged across each membrane, an anode side **conductive separator plate** having a **gas** fuel **supply** path to the anode, and a cathode side **conductive separator plate** having oxidant **gas supply** path to the cathode;

first end plate located on one end of the unit cell **stack**;

second end plate located on the other end of the unit cell **stack**;

an auxiliary plate located at least outside the first end plate;

at least one restraining device having band shape to restrain a first member located on one end of assembly including unit cell **stack**, first and second end **plates** and auxiliary plate and a second member on the other end to restrict separation of the first and second members;

a screw fitted in a threaded hole formed in the auxiliary plate such that the end of the screw contacts the first end plate; and

compressive device generating a repulsive force to compress the unit cell **stack** when the screw is fitted into the threaded hole of the auxiliary plate.

The auxiliary plate is made of metal having elasticity and also functions as the compressive device.

INDEPENDENT CLAIMS are given for **polymer electrolyte** fuel **cells.**

USE - For portable power sources, electric vehicle power sources and domestic co-generation systems.

ADVANTAGE - The fuel cell has a small sized, simply constructed unit cell **stack** fastening mechanism. Creep deformation is reduced due to long-term pressure application.

DESCRIPTION OF DRAWING(S) - The drawing shows a sectional view of the **polymer electrolyte** fuel **cell.**

Unit cell **stack** 30
First end plate 31
Second end plate 32
Auxiliary plate 33, 34
Screw 35
Restraining device 39

Dwg.3/13
FS CPI EPI
FA AB; GI
MC CPI: A12-E06B; L03-E04
EPI: X16-E01A1

L49 ANSWER 39 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:811493 CAPLUS
DN 132:38135
ED Entered STN: 24 Dec 1999
TI **Polymer electrolyte** fuel **cell stacks**
IN Hatoh, Kazuhito; Yasumoto, Eiichi; Nishida, Kazufumi; Gyoten, Hisaaki
PA Matsushita Electric Industrial Co., Ltd., Japan
SO PCT Int. Appl., 18 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
IC ICM H01M008-24
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 9966580	A1	19991223	WO 1999-JP3124	19990610
W: CN, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 2000003720	A2	20000107	JP 1998-166636	19980615
JP 3483116	B2	20040106		
EP 1098381	A1	20010509	EP 1999-923999	19990610
R: DE, FR, GB, IT				
PRAI JP 1998-166636	A	19980615		
WO 1999-JP3124	W	19990610		

AB The fuel cell **stacks** have unit **cells** containing a **polymer electrolyte** membrane between a pair of catalytic electrodes, separators supplying fuel and oxidant gases to resp. electrodes on opposite sides of the unit cells, collector plates, insulator plates, and end plates; where the **stacks** have means installed between the insulator plates and collector plates or inside the end plates to remove heat and water from the off **gases** and to **supply** the supplied heat and water to fuel and oxidant gases.
ST **polymer electrolyte** fuel **cell** heat water recovery
IT Fuel **cells**
(structure of **polymer electrolyte** fuel **cell stacks** containing means for heat and water recovery from off gases)
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Fuji Electric Co Ltd; JP 06-132038 A 1994 CAPLUS
(2) Matsushita Electric Industrial Co Ltd; EP 788172 A CAPLUS
(3) Matsushita Electric Industrial Co Ltd; JP 09-213359 A 1997 CAPLUS
(4) Mitsubishi Heavy Industries Ltd; JP 07-176313 A 1995
(5) Tanaka Kikinzoku Kogyo KK; JP 09-204924 A 1997 CAPLUS

L49 ANSWER 40 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:387855 CAPLUS
DN 131:21321
ED Entered STN: 23 Jun 1999
TI Solid **polymer electrolyte** fuel **cell** power plants
IN Saito, Kazuo; Kogami, Taiji; Ueno, Sanji; Chizawa, Hiroshi
PA Toshiba Corp., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 11162490	A2	19990618	JP 1997-322967	19971125
PRAI JP 1997-322967		19971125		

AB The power plants have a fuel cell **stack** containing ≥1 unit **cell**, having a **polymer electrolyte** membrane between a cathode and an anode, a pipe supplying a fuel gas to the anode, and a pipe supplying an oxidant gas to the cathode; where a humidifying means is installed on the fuel gas and/or oxidant **gas** supplying pipes to **supply** steam or water mist to the gas.
ST **polymer electrolyte** fuel **cell** power plant
IT Fuel **cells**
(power plants; solid **polymer electrolyte** fuel **cell** power plants containing reaction gas humidifying means)

L49 ANSWER 41 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1999:413007 CAPLUS
DN 131:33874
ED Entered STN: 05 Jul 1999
TI PEM fuel cell system with dampening and/or cooling with liquid medium, their use as well as a method for dampening and cooling of such system
IN von Helmolt, Rittmar
PA Siemens A.-G., Germany
SO Ger., 10 pp.
CODEN: GWXXAW
DT Patent
LA German
IC ICM H01M008-04
ICS H01M008-22
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 19821766	C1	19990624	DE 1998-19821766	19980514
CA 2331664	AA	19991125	CA 1999-2331664	19990503

WO 9960633 A2 19991125 WO 1999-DE1293 19990503
WO 9960633 A3 20000106
W: CA, JP, NO, US
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE
EP 1086503 A2 20010328 EP 1999-929078 19990503
R: AT, CH, DE, DK, ES, FR, GB, IT, LI, NL, SE, FI
JP 2002516461 T2 20020604 JP 2000-550154 19990503
US 6576357 B1 20030610 US 2000-712396 20001114
PRAI DE 1998-19821766 A 19980514
WO 1999-DE1293 W 19990503
AB A **polymer electrolyte** fuel **cell** system with dampening and/or cooling with liquid medium (especially for application in mobile systems) has a liquid distributor in one or both axial process **gas supply** pipelines. The liquid distributor generates directly droplets (with the help of a sound wave) before the gas inlet of each fuel cell unit of a fuel cell **stack** and combines with the process gas.
ST fuel cell system dampening cooling
IT Fuel **cells**
Sound and Ultrasound
(**polymer electrolyte** fuel **cell** system with dampening and/or cooling with liquid medium)
RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Anon; EP 0743693 A1 CAPLUS
(2) Anon; DE 19641143 A1
(3) Anon; DE 4442285 C1 CAPLUS
(4) Anon; WO 9701827 A1

L49 ANSWER 42 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1999-250506 [21] WPIX
DNN N1999-187117 DNC C1999-073482
TI Fuel supply arrangement in solid **polymer electrolyte** type fuel battery - includes gas flow path equipped with water inlet through which water is supplied among fuel gas and oxidising agent gas flow paths.
DC A85 L03 X16
PA (FJIE) FUJI ELECTRIC CO LTD
CYC 1
PI JP 11073979 A 19990316 (199921)* 6p H01M008-02
ADT JP 11073979 A JP 1997-231989 19970828
PRAI JP 1997-231989 19970828
IC ICM H01M008-02
ICS H01M008-04; H01M008-10
AB JP 11073979 A UPAB: 19990603
NOVELTY - A gas flow path is equipped with main **water** inlet through which **cooling water** is supplied. **Water** is supplied among a fuel gas flow path and oxidizing agent gas flow path.
DETAILED DESCRIPTION - The battery has a fuel gas and oxidizing gas flow paths distributed on both the sides of membrane electrode contact

body. The contact body joins a catalyst layer to main surface of the solid **polymer electrolyte membrane** (1) forms a multi-layered cell by several laminating single cells. The single cells are formed by pinching at separators (2,2A) from the gas impermeable material. The oxidant gas containing oxygen or fuel gas containing hydrogen is supplied for generating electricity using an electrochemical reaction. The battery is maintained at predetermined temperature with **cooling water** which flows in a **cooling** circuit formed by partition of the single cell with the separator.

USE - In solid **polymers electrolyte** type fuel battery.

ADVANTAGE - The electrolyte film is maintained at a predetermined moist state by simple structure. The dimension and the weight of fuel battery multilayer body are reduced.

DESCRIPTION OF DRAWING(S) - The figure illustrates sectional drawing of the basic structure of fuel supply arrangement of the fuel battery. (1) Electrolyte film; (2,2A) Separators.

Dwg.1/7

FS CPI EPI
FA AB; GI
MC CPI: A12-E06; L03-E04A
EPI: X16-C01C; X16-C09; X16-C15

L49 ANSWER 43 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1998:250893 CAPLUS
DN 128:272828
ED Entered STN: 02 May 1998
TI Solid **polymer electrolyte** fuel **cell** power plants
IN Komaki, Hideaki
PA Zaidan Hojin Nippon Zosen Kenkyu Kyokai, Japan; Ishikawajima-Harima Heavy Industries Co., Ltd.
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-06
ICS H01M008-06; H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 10106607	A2	19980424	JP 1996-279916	19961002
PRAI JP 1996-279916		19961002		

AB The power plants have **stacks** containing unit **cells**, having a **polymer electrolyte** membrane held between a cathode and an anode and reaction **gas supply** for resp. electrodes, **stacked** alternately with separators, and a reformer supplying a fuel gas to cell anodes by reforming a raw fuel and containing a combustion chamber supplied with anode off gas from the cells; where a bypass pipe is connected to the pipe conducting the anode off gas to the burner to bypass the combustion chamber, and the amount of the anode off gas

supplied to the combustion chamber is controlled depending on the temperature in
the combustion chamber, by valve installed on the pipes at the downstream side of the joining point.

ST **polymer electrolyte** fuel **cell** power plant

IT Fuel **cells**
(structure of solid **polymer electrolyte** fuel **cell** power plants)

L49 ANSWER 44 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN
AN 1998-298268 [26] WPIX
DNN N1998-233304
TI **Polymer electrolyte membrane** fuel **cell stack.** - Uses **stack** of fuel cells with membrane electrode assembly with gas distributor supplying gas to anode layer..
DC X16
IN EHRENBERG, S G; JACKSON, R J; NEUTZLER, J K; TANGREDI, T N
PA (DAIS-N) DAIS CORP
CYC 78
PI WO 9821773 A1 19980522 (199826)* EN 71p H01M008-04
RW: AT BE CH DE DK EA ES FI FR GB GH GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW
AU 9871819 A 19980603 (199842) H01M008-04
ADT WO 9821773 A1 WO 1997-US20898 19971114; AU 9871819 A AU 1998-71819 19971114
FDT AU 9871819 A Based on WO 9821773
PRAI US 1996-30558P 19961114
IC ICM H01M008-04
AB WO 9821773 A UPAB: 19980701
The fuel cell **stack** comprises fuel cells (29) that are **stacked** one upon another. Each fuel cell includes a membrane electrode, with a proton exchange membrane between the cathode and anode layers. A gas distributor (43,55) engages with the membrane electrode assembly to **supply gas** to the anode layer.

The cathode side of each fuel cell may include passages for allowing oxygenated gas to pass therethrough and over the cathode layer of the particular cell. The gas distributor may comprises an enclosure that surrounds the outer edge of the anode layer of the fuel cell for a plate which faces the anode layer.

ADVANTAGE - Low cost and simple to assemble fuel cell **stack**.

Dwg.4A/19
FS EPI
FA AB; GI
MC EPI: X16-C09

L49 ANSWER 45 OF 53 WPIX COPYRIGHT 2004 THOMSON DERWENT on STN

AN 1998-102167 [10] WPIX
DNN N1998-081877
TI Fuel cell battery flow distribution evaluation method - detecting voltage characteristic across each cell during supply of anode and cathode spaces with gas flow having varying hydrogen partial pressure.
DC S02 X16
IN BUCHNER, P; GRUENE, H
PA (SIEI) SIEMENS AG
CYC 1
PI DE 19649435 C1 19980212 (199810)* H01M008-04
ADT DE 19649435 C1 DE 1996-19649435 19961128
PRAI DE 1996-19649435 19961128
IC ICM H01M008-04
ICS G01P005-14
AB DE 19649435 C UPAB: 19980309
The flow distribution evaluation method for a number of parallel anode and cathode spaces of a **polymer electrolyte membrane** fuel cell battery has the anode and cathode spaces supplied with a gas flow exhibiting a given hydrogen partial pressure, which is varied while the time characteristic of the voltage across each individual cell is measured. Pref. the anode and cathode gas spaces are supplied with a nitrogen/hydrogen mixture which has a hydrogen content which is reduced during the **measurement** of the cell **voltage.** ADVANTAGE - Simple verification of uniform flow distribution of reaction gases through series or parallel fuel cells. Dwg.0/0
FS EPI
FA AB
MC EPI: S02-G02X; X16-C09; X16-H

L49 ANSWER 46 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:617780 CAPLUS
DN 127:280785
ED Entered STN: 27 Sep 1997
TI Method for operation condition monitoring and operation control for **polymer electrolyte** fuel **cell stacks**
IN Ueno, Masataka; Nakajima, Hiroshi; Shiraishi, Goichi
PA Echos Research K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 09245826	A2	19970919	JP 1996-69447	19960229
PRAI JP 1996-69447		19960229		

AB Fuel cell operation conditions are monitored by using means for recording the voltage-time pattern of individual cells or cell groups under

different operation conditions in memory devices, monitoring the voltage pattern, and comparing the monitored pattern with the recorded pattern. The cells are operated by adjusting the operation conditions (**supply** of water, fuel **gas**, and/or oxidant and/or cooling condition) of the cells according the the result of the comparison of the pattern.

ST fuel cell operation monitoring controlling

IT Fuel cells
(method for operation condition monitoring and operation control for **polymer electrolyte** fuel **cell stacks**)

L49 ANSWER 47 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:473508 CAPLUS
DN 127:83892
ED Entered STN: 30 Jul 1997
TI Solid **polymer electrolyte** fuel **cells**
IN Matsubayashi, Takamasa; Nakaoka, Toru; Miyake, Yasuo
PA Sanyo Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 7 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
ICS H01M008-24
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09139222	A2	19970527	JP 1995-296414	19951115
PRAI	JP 1995-296414		19951115		

AB The fuel cells have a **stack** of alternate unit **cells**, having a **polymer electrolyte** membrane between a cathode and an anode, and ribbed separators and are supplied with a mixture of water and a fuel gas in the anode side gas channels during operation; where the anode side gas channels have a water supplying and distributing manifold, a fuel gas supplying and distributing manifold, and a means for mixing water and the fuel gas. The **water** wets the electrolyte membranes, **cools** the cells, and prevents deterioration of the cells.

ST **polymer electrolyte** wetting fuel **cell**; fuel cell fuel **gas** water **supply**

IT Fuel **cells**
(structure of solid **polymer electrolyte** fuel **cells** for supplying water containing fuel gas for anodes)

L49 ANSWER 48 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:377339 CAPLUS
DN 127:20982
ED Entered STN: 16 Jun 1997
TI **Stacked** fuel **cell** with solid **polymer electrolyte**

IN Kabasawa, Akihiro
PA Fuji Electric Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-02
ICS H01M008-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09092309	A2	19970404	JP 1995-244088	19950922
PRAI	JP 1995-244088		19950922		

AB Each unit cell in a **stack** of fuel **cells** with a **polymer electrolyte** is provided with a humidifying unit installed close to the cell. Gas which is passed through the porous substrate and water-permeable film to separator is humidified. The **supply** of humidified **gas** provides for stable operation even without stationary humidifiers.
ST humidification gas fuel cell solid electrolyte
IT Air conditioning
(humidification; **stacked** fuel **cell** with solid **polymer electrolyte**)
IT Fuel cells
(**stacked** fuel **cell** with solid **polymer electrolyte**)

L49 ANSWER 49 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1997:116433 CAPLUS
DN 126:133526
ED Entered STN: 20 Feb 1997
TI Solid **polymer electrolyte** fuel **cell** **stacks** with built-in cathode gas humidifying means
IN Nakajima, Riichi; Hamada, Akira; Matsubayashi, Takamasa; Myake, Yasuo
PA Sanyo Denki Kk, Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-04
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 08321317	A2	19961203	JP 1995-126582	19950525
	JP 3219639	B2	20011015		
PRAI	JP 1995-126582		19950525		

AB The fuel cell **stacks** have a water recovering means in the air outlet header, for recovering water from cathode off gas by heat exchange, and a porous material having 1 end near the water recovering means, to receive the recovered water, and the other end crossing inside the air

inlet header. A H absorbing alloy tank for supplying H as fuel gas for the cell anodes may be used for the heat exchange for water recovery.

ST solid **polymer electrolyte** fuel **cell** humidifying; fuel cell air humidifying water recovering

IT Alloys, uses
RL: DEV (Device component use); USES (Uses)
(hydrogen absorbing; fuel cell **stacks** containing hydrogen absorbing alloys for fuel **gas supply** and for recovering water from cathode off gas for humidifying air for cathodes)

IT Fuel **cells**
(solid **polymer electrolyte** fuel **cell** **stacks** containing means for recovering water from cathode off gas for humidifying air for cathodes)

L49 ANSWER 50 OF 53 CAPLUS COPYRIGHT 2004 ACS on STN
AN 1992:63503 CAPLUS
DN 116:63503
ED Entered STN: 21 Feb 1992
TI Solid **polymeric** electrolyte fuel-cell power plants and their operation
IN Furuya, Choichi; Ichikawa, Kuninobu; Wada, Ko; Imai, Tetsuya; Takeuchi, Yoshiyuki; Yanagi, Masaaki
PA Mitsubishi Heavy Industries, Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM H01M008-06
ICS H01M008-04; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03203165	A2	19910904	JP 1989-338731	19891228
	JP 2761066	B2	19980604		
PRAI	JP 1989-338731		19891228		

AB The power plants have MeOH-steam reformers, CO-removing devices, and humidity-regulating devices connected in sequence to fuel cells comprising a **polymeric** electrolyte membrane held between a pair of **gas**-diffusion electrodes to **supply** H for the cells, where the humidity-regulating device has a hydrophobic gas-diffusion membrane, and the gas exited from the CO-removing devices is made in contact with **cooling water** from the cells via the membrane. The CO-removing devices can be chemical or electrochem. oxidizing devices. The operation of the power plants includes steps of decreasing CO content in the H-rich reformed gas to <10 ppm, saturating the humidity of the CO-removed gas with the **cooling water**, and controlling the operation temperature of the fuel cells at 50-100°.

ST **polymer electrolyte** fuel **cell** power plant; carbon monoxide removal fuel cell; humidity control hydrogen fuel cell

IT Humidity
(saturation with, of hydrogen-rich reforming gas, for solid **polymer**

-**electrolyte** fuel **cells**)
IT Fuel cells
(solid-state, power plant, with **polymer electrolytes**, structure and operation of)
IT 1333-74-0, Hydrogen, uses
RL: USES (Uses)
(carbon monoxide removal from and humidity saturation of, for solid **polymer-electrolyte** fuel **cells**)
IT 630-08-0, Carbon monoxide, miscellaneous
RL: REM (Removal or disposal); PROC (Process)
(removal of, from hydrogen-rich reforming gas, for solid **polymer-electrolyte** fuel **cells**)

L49 ANSWER 51 OF 53 JAPIO (C) 2004 JPO on STN
AN 2003-257469 JAPIO
TI PEM FUEL CELL **STACK** AND ITS MANUFACTURING METHOD
IN ZUBER RALF DR; BAYER ARMIN; KUEHNHOLD HEIKE; DZALLAS HOLGER; DAURER MARC
PA OMG AG & CO KG
PI JP 2003257469 A 20030912 Heisei
AI JP 2003-54744 (JP2003054744 Heisei) 20030228
PRAI EP 2002-4599 20020228
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2003
IC ICM H01M008-24
ICS H01M008-00; H01M008-10
AB PROBLEM TO BE SOLVED: To provide a fuel cell **stack** having a simplified design and good electrical performance.
SOLUTION: Each fuel cell includes a membrane electrode assembly 2 and conductive bipolar states 3, 4 and the **membrane** electrode assembly includes a **polymer electrolyte membrane** 5. The **polymer electrolyte membrane** has contact with reaction layers 6, 7 at the side faces. The reaction layers cover a region smaller than the **polymer electrolyte membrane**, and compressive **gas supply** layers 8, 9 of carbon fiber materials are provided between each of the reaction layers and each of bipolar plates adjacent thereto (substantially combined with the reaction layers). Gaskets 11, 12 are located outside the region covered with the **gas supply** layers. The PEM fuel cell **stack** has a gas diffusion electrode compressed to be thinner, 50-85% of an original thickness.
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L49 ANSWER 52 OF 53 JAPIO (C) 2004 JPO on STN
AN 2002-110198 JAPIO
TI **POLYMER-ELECTROLYTE** FUEL **CELL STACK** AND ELECTRIC VEHICLE WITH THIS FUEL CELL **STACK**
IN ZUBER RALF DR; BAYER ARMIN; KUEHNHOLD HEIKE; STENKE UDO DR
PA DMC 2 DEGUSSA METALS CATALYSTS CERDEC AG
PI JP 2002110198 A 20020412 Heisei
AI JP 2001-258420 (JP2001258420 Heisei) 20010828
PRAI DE 2000-10042744 20000831
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2002
IC ICM H01M008-02

ICS H01M004-86; H01M008-00; H01M008-10

AB PROBLEM TO BE SOLVED: To provide a fuel cell **stack** having simple composition compared with a prior art which is equivalent or improved in electrical output.
SOLUTION: A PEM fuel cell **stack** comprises one or more fuel cell(s) 1, which is (or are) arranged above and blow, having membrane-electrode units (2) between two electrically conductive bipolar electrode plates (3 and 4) having passages (10) whose one sides are opened to **supply** a reactive **gas** on their surfaces. In this case, each **membrane**-electrode unit has a **polymer electrolyte- membrane** (5) which comes into contact with reaction layers (6 and 7) on its surface, the reactive layers have their surface areas which are smaller than that of the **polymer electrolyte-membrane.** Gas-distributing layers (8 and 9) comprising carbon fiber-made cloth, which can be compressed and have rough pores, are provided between each reaction layer and the bipolar electrode plate adjacent to the reaction layers. Packing (11 and 12) is inserted in an area except the surface covered with the gas-distributing layers (8 and 9), and the gas- distributing layers have a thickness of D1 and the packing has a thickness of D2.
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L49 ANSWER 53 OF 53 JAPIO (C) 2004 JPO on STN
AN 2000-123853 JAPIO
TI FUEL CELL SYSTEM
IN KURITA KENJI
PA AISIN SEIKI CO LTD
PI JP 2000123853 A 20000428 Heisei
AI JP 1998-296672 (JP10296672 Heisei) 19981019
PRAI JP 1998-296672 19981019
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2000
IC ICM H01M008-04
AB PROBLEM TO BE SOLVED: To eliminate differential pressure between fuel gas and oxidizing agent gas within a fuel cell **stack** in stationary operation, and prevent the breakage of a solid **polymer electrolyte membrane.**
SOLUTION: An opening adjusting means V1 for adjusting an oxidizing agent gas pressure is installed in an oxidizing agent gas pipe line connecting an oxidizing agent **gas supply** means 43 and an oxidizing agent **gas supply** opening of a fuel cell **stack** 2, an opening adjusting means V2 for adjusting fuel gas pressure is installed in a fuel gas pipe line connecting a fuel **gas supply** means and a fuel **gas supply** opening of the fuel cell **stack** 2, and a combustion means 3 for burning unutilized fuel gas and unutilized oxidizing agent gas both exhausted from the fuel cell **stack** 2 is installed to constitute a fuel cell system.
COPYRIGHT: (C)2000,JPO

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